

ROADS AND STREETS

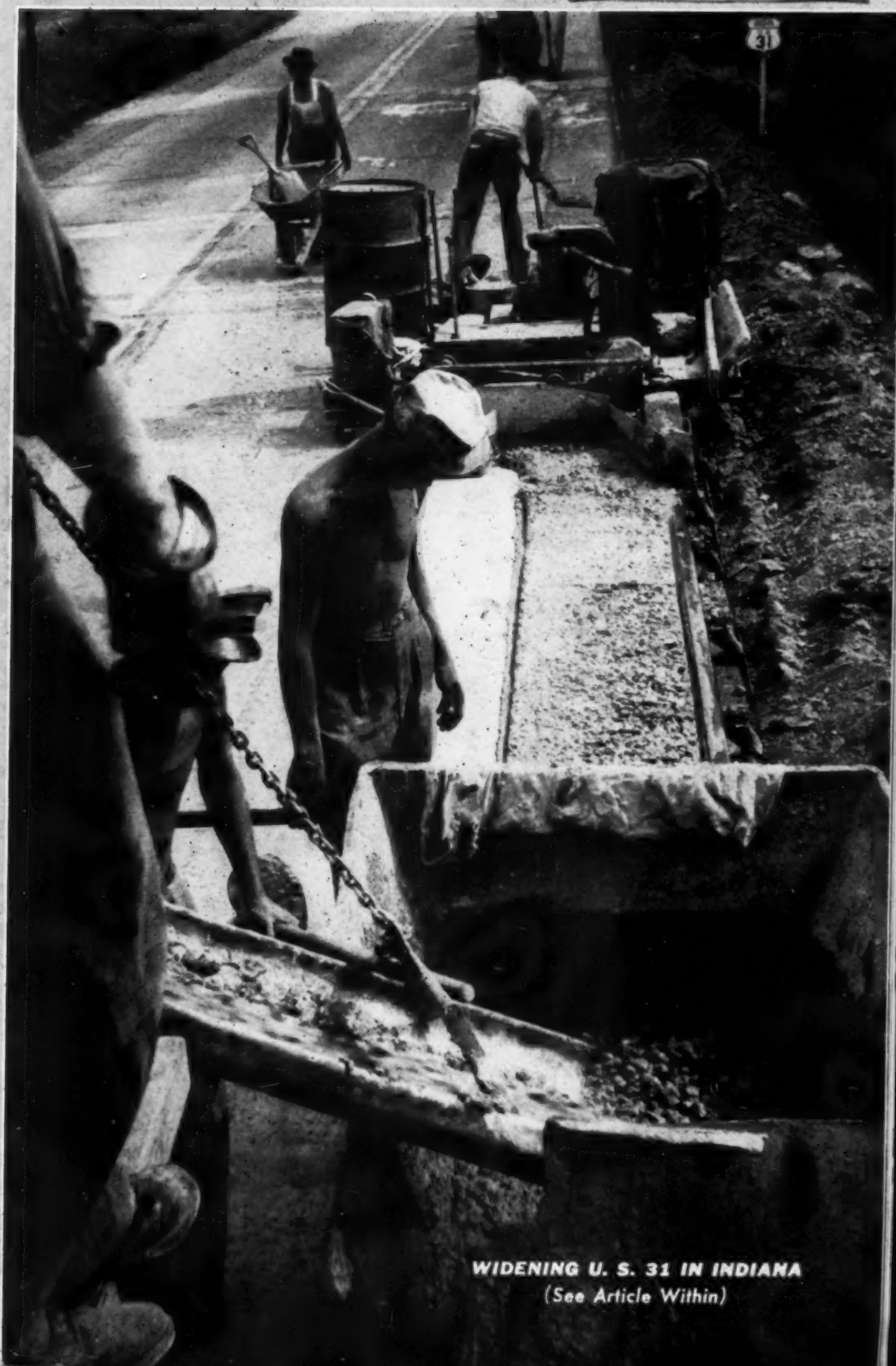
LIBRARY

JUL 31 1944

DETROIT

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WIDENING U. S. 31 IN INDIANA
(See Article Within)

JULY, 1944

"Most Valuable Machines on the Job"... ADAMS MOTOR GRADERS



One of a series of ads on Adams motor grader features

***"We use our Adams Motor Graders in a dozen and one different ways," says a midwest road contractor, "and because they are so versatile, they are just about the most valuable machines on our jobs. Depending upon the job, of course, we use them for cutting back and finishing banks, for cutting and finishing the ditches, and for bringing the sub-grade to specifications. If the job happens to be a blacktop or stabilization mix, the graders do the mixing and spreading. The scarifier comes in handy many times and I am thinking perhaps we should have one of those bulldozer attachments for the front end of the machine for pushing rubbish off the

right-of-way and for minor leveling operations."

Whether you are contractor or highway official, you, too, will find many profitable uses for Adams Motor Graders on the building and maintenance of roads and streets, airfields and flight strips, and in logging and strip-mining operations. If you have work connected with the war effort, perhaps you are eligible to obtain one of the few new machines allocated for this purpose. Talk the matter over with your local Adams dealer.

J. D. ADAMS COMPANY • INDIANAPOLIS, IND.



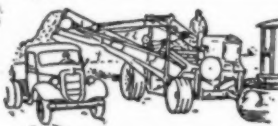
At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



MOTOR GRADERS



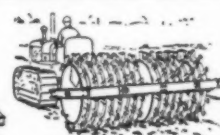
PULL-TYPE GRADERS



ELEVATING GRADERS



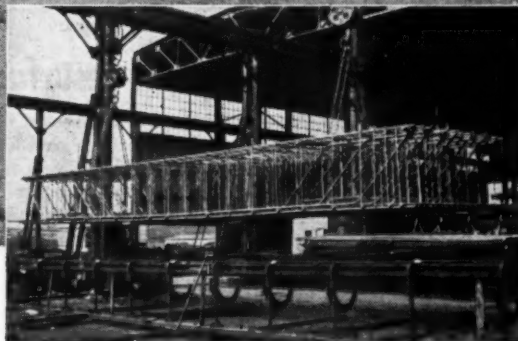
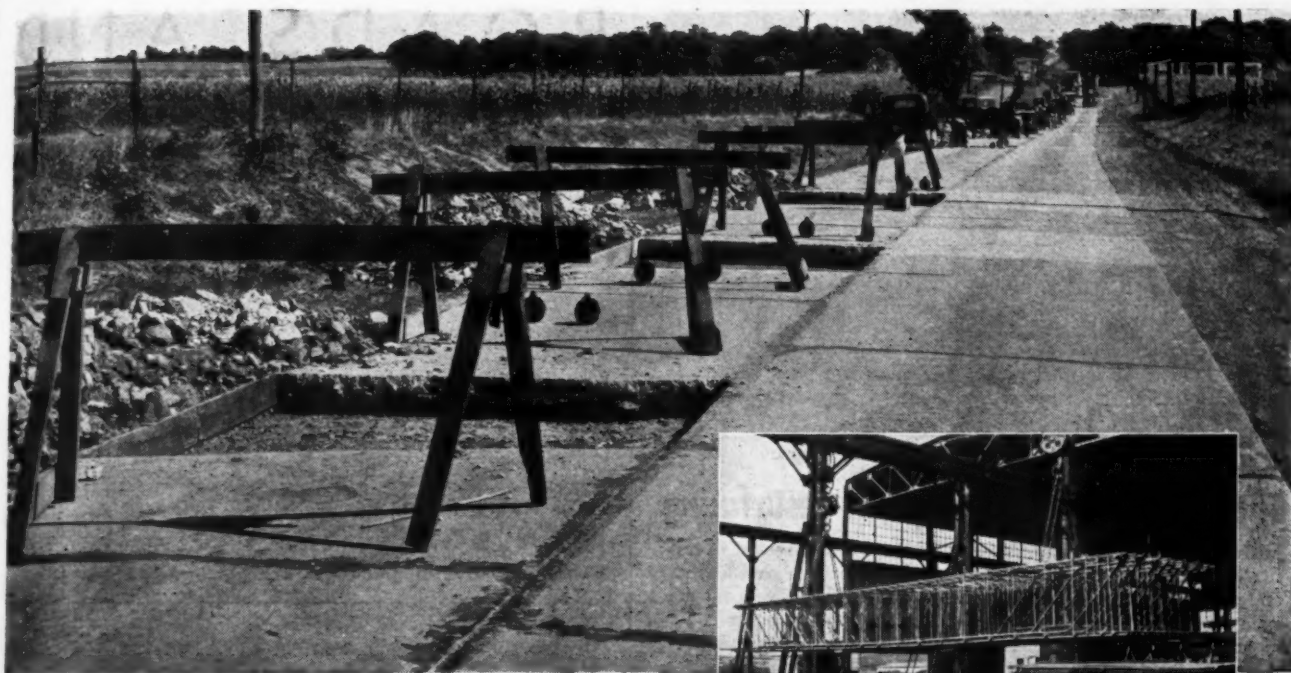
HAULING SCRAPERS



TAMPING ROLLERS

ADAMS

★ ROAD-BUILDING AND ★
EARTH-MOVING EQUIPMENT



Why concrete roads need steel reinforcement

No steel reinforcement in this concrete road—and so it's cracking up. A tragic and familiar story, today, when wartime traffic jounces and bounces over obsolescent highways, chewing up precious rubber, suffering delays, and putting a cruel strain upon essential vehicles.

Fortunately, however, the great majority of our roads have stood up sturdily under their heavy burdens—thanks to wise pre-war building practices.

In the construction of such highways, without which our war production effort might have been a very different story, Bethlehem Road Products have played a substantial role. Bethlehem Reinforcing Bars, Bar Mats and Road Joints, embedded in the concrete, have helped prevent cracks and heaving.

In addition, Bethlehem Safety Beam Guard Rails and Steel Highway Posts have stood guard alongside the key highways on which war workers, war supplies and military convoys roll safely to their destinations.

This "cage" of reinforcing steel was supplied by Bethlehem for the concrete road-bed of a new Pennsylvania Railroad bridge near Trenton, N. J.—a rush job on one of the nation's vital railway arteries. The complicated unit was prefabricated in Bethlehem's Philadelphia warehouse, and shipped to the job site as shown.

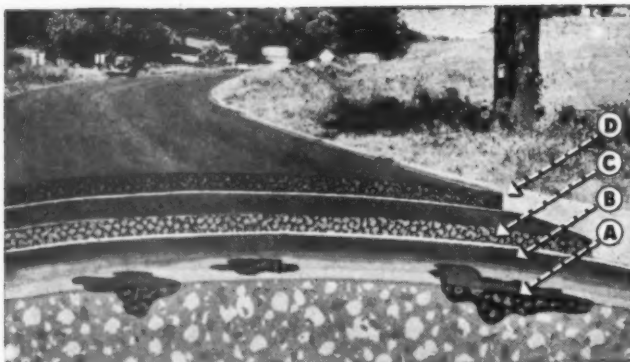
Next time you need reinforcing bars, even though you may not wish to have them preassembled and shipped as a unit, remember there's a Bethlehem warehouse near you, equipped to cut and bend bars in any shape or size you require.

Bethlehem Road Products

ROAD JOINTS
REINFORCING BARS AND BAR MATS
DOWELS
DOWEL BAR SUPPORTS
BAR TIES
HIGHWAY GUARD CABLE
CABLE BRACKETS
SAFETY BEAM GUARD RAILS
GUARD RAIL ANCHOR RODS
STEEL HIGHWAY POSTS
STEEL SHEET PILING
STEEL H AND Z PILING
TURNBUCKLES
WIRE ROPE AND STRAND



ROADS AND STREETS, July, 1944



The cross-section on the illustration above shows steps usually taken in asphalt-resurfacing.

A. Spot Patching
B. Prime Coat

C. Binder Course
D. Wearing Course

The why and how of Asphalt-resurfacing

MANY highway departments have found the answer to today's pressing problem of keeping highway systems up to wartime efficiency, and preserving them for peacetime needs by resurfacing with asphalt.

Asphalt-resurfacing now, will help make vital transport equipment—trucks, buses, tires, etc.—last for the duration. It will give you a head start on your highway program when travel-hungry, peacetime motorists ride again.

A Standard Asphalt Representative will be glad to give you details of the methods and procedure followed by other highway departments now using asphalt-resurfacing to keep up their highway systems. Call the local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois.

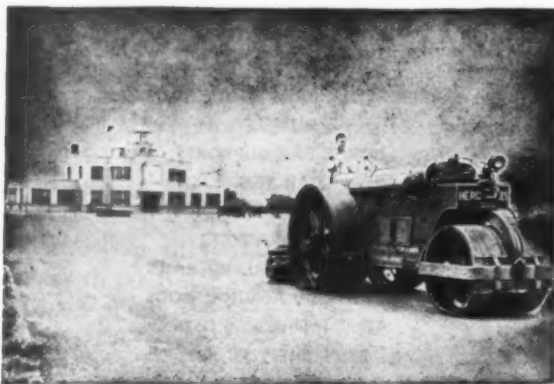
Oil is Ammunition... Use it Wisely

STANDARD OIL COMPANY (INDIANA)



HERCULES ROLLERS

have moved to Bucyrus, Ohio



From new headquarters the Hercules Roller Company is ready to supply repairs and service information for machines in the field. When you have maintenance or rolling problems, bring them to us or to HERCULES Dealers.

When you need and can buy a Roller—Buy a HERCULES!

HERCULES ROLLER COMPANY
BUCYRUS, OHIO

ROADS AND STREETS

Vol. 87, No. 7

July, 1944



A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; and to the construction and maintenance of airports.

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD
ROADS MAGAZINE AND ENGINEERING & CONTRACTING

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; HAROLD J. McKEEVER, Editor; CHARLES T. MURRAY, Managing Editor; JOHN C. BLACK, Field Editor; LT. COL. V. J. BROWN, Publishing Director (Absent on Military Duty); H. J. CONWAY, Advertising Editor; L. R. VICKERS, Promotional Director.

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"Can Do-Will Do-DID"

"GUADALCANAL SPEAKS"

The experts claimed it couldn't be done. The Seabees said, "Can Do, Will Do". So, true to their slogan, they 'did' by erecting this 150 ft. radio tower at Guadalcanal with the aid of a Bulldozer and a Lorain Crane.

DAILY, the list grows longer, the record more amazing, of the jobs being performed by the famed Seabees in the drive to Tokyo and Berlin.

And, closely related to the records being run up by these famed construction battalions, are almost unbelievable exploits of the tractors, bulldozers, shovels, and cranes that travel with them. We know, too, that among them are many noteworthy achievements of Lorains performing material handling jobs no one ever dreamed they would ever be asked to do, proving again their versatility, ruggedness, extra power and speed under the toughest imaginable conditions.

But, there are still bigger jobs coming up in the postwar period . . . when efficient and dependable equipment will be equally vital. And, because of Lorains' war-proven developments and performance you can figure on being in a better competitive position to *get* and *work* those big peacetime jobs—at a profit—with Lorains.

**THE THEW SHOVEL COMPANY
LORAIN, OHIO**

Official U. S. Navy Photograph

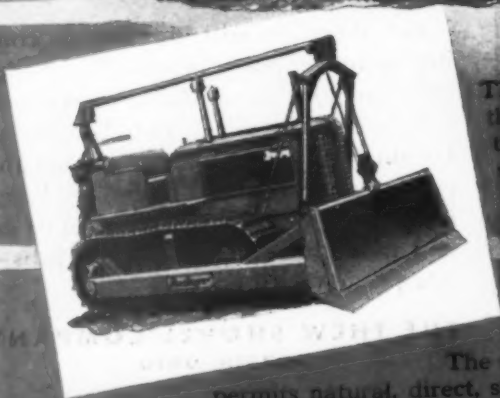
Reg. Trade Mark

thew-Lorain

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

ROADS AND STREETS, July, 1944

look it over...
The NEW Buckeye Dozer!



This is the NEW Buckeye cable-controlled dozer that is setting higher standards of bulldozer and trailbuilder performance under the toughest possible operating conditions. Hour after hour, testing engineers put it through the most punishing operations with just one thought in mind—"Break the bulldozer." But it couldn't be done! They roll larger yardage loads, punch out boulders, uproot huge trees and stumps, and do a hundred and one odd jobs better than you ever imagined possible.

The single point, center lift suspension of the moldboard permits natural, direct, straight lift of the blade. Full power of the tractor engine is utilized and maximum lifting power provided for the blade. The new moldboard design packs more strength into less weight. There's no useless excess weight to absorb tractor power. Rigid and fully braced, the moldboard can withstand all types of dozing work. Blade is reversible with replaceable corner bits.

Now available for Allis-Chalmers and Case Tractors. Write for details.

CENTRAL **Lift**

Built by

Buckeye



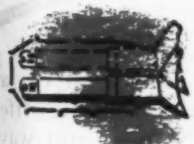
these features mean **EXTRA PROFITS**

...even on your toughest jobs!



Center Lift, single point suspension — Blade is raised in natural, direct way assuring maximum lifting power. Wear and friction losses are minimized. Design and construction of the new model are simplified. Full power of tractor engine is utilized.

Blade easily angled — With new push arm and horn construction, trailbuilder blade can easily be adjusted to right or left on a single king pin to standard desired angles by removing the two landside pins which hold the blade rigidly in place when angled or straight.



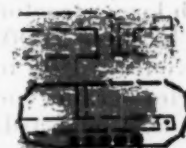
Double Trunnion Tilting — Double trunnion mounting permits either end of trailbuilder or bulldozer blade to be tilted 12° by attaching one push arm to the top trunnion on one side while the opposite arm is attached to the lower trunnion on the other side.

Bigger yardage loads — Scientific blade curvature rolls the load ahead enabling the operator to take deeper cuts — no dead weight — less power required — bigger payloads — moves faster — less strain on tractor — blade digs its own way in like a plow.



Finger-Tip, Split-Second, Fraction-of-an-inch Control — Buckeye Power Control Unit takes hold of the line with a smooth, powerful pull, without any jerking action. Large clutches and brakes, plus external location, mean cool operation and long life.

Balanced Design — Full length of crawlers stay on the ground — no lost traction — maximum pushing power assured — mechanical downward pressure not required. Weight is distributed uniformly over each of the crawler shoes on the ground. Blade hugs radiator.



BUCKEYE TRACTION DITCHER CO.

Findlay, Ohio

How **TOURNAPULL SPEED** cuts Costs and increases Profits

You can profitably handle both long and short hauls . . . move more yardage with fewer units . . . save on equipment cost and get lower net cost per yard.



JOB-PROVED

1800 Built and Shipped

TOURNAPULLS operate from 2.6 to 14.9 m.p.h. — that's 2 to 3 times faster than the fastest tractors. Chart here shows what this greater speed can mean to you in extra yardage.

ONE-WAY HAUL DISTANCE—CU. YDS. PER HOUR*

Tractor-drawn Scrapers:	400'	600'	800'	1,000'	2,000'	3,000'	4,000'	5,000'	6,000'
30-Yd. Capacity	—	—	175	153	97	71	56	46	39
23-Yd. Capacity	—	187	162	142	89	65	51	—	—
18-Yd. Capacity	196	163	139	122	74	—	—	—	—
15-Yd. Capacity	170	142	121	106	65	—	—	—	—
With 15-Yd. Super C Tournapull you get:	200	180	168	156	116	91	76	65	55

*All units pusher loaded on level.

Note that even on short hauls — 400 to 1000 feet one-way — Tournapulls compete very favorably with larger tractor-scraper outfits. While on longer hauls — 2000 to 6000 feet — Tournapulls move from 19% to 41% more than even a 30-yard tractor-scraper outfit — with less first cost and less cost per yard.

Figure 10,000-Hour Profit

As an example, take the extra yardage a Tournapull will move over a 10,000-hour working life on a 2000-foot, one-way haul. It varies from 190,000 to 510,000 pay yards, depending on comparative scraper size. Estimate the profit to yourself on this extra yardage at your own usual bid price! Can you afford to use more expensive, slower-moving rigs, when this extra yardage can be yours with the fast-moving, rubber-tired power of Tournapulls? Figure NOW to use job-proved Tournapulls on your postwar jobs. It will pay you—in first cost, lower cost per yard and greater profit each working hour.

Tournapulls, like big-capacity scrapers, are designed for pusher loading. They load quickly, haul and spread their own loads, are one-man operated. Because of their large diameter pneumatic tires of large cross section — plus low pressure and greater ground area — Tournapulls operate over concrete without surface damage, travel between jobs under their own power, thus save on freight.

pull will move over a 10,000-hour working life on a 2000-foot, one-way haul. It varies from 190,000 to 510,000 pay yards, depending on comparative scraper size. Estimate the profit to yourself on this extra yardage at your own usual bid price! Can you afford to use more expensive, slower-moving rigs, when this extra yardage can be yours with the fast-moving, rubber-tired power of Tournapulls? Figure NOW to use job-proved Tournapulls on your postwar jobs. It will pay you—in first cost, lower cost per yard and greater profit each working hour.

LETOURNEAU TOURNAPULLS

Also, LeTOURNEAU (Aust.) Pty., Ltd., Rydalmere, New South Wales, Australia

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

Mfrs. of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, TOURNAROPES*, TOURNATRAILERS*, TOURNAWELDS*, TOURNACRANES*.

*Trade Mark Reg. U. S. Pat. Off.

MADE IN U.S.A.



THIS IS NO PICNIC

WORKING AND LIVING CONDITIONS ON THIS JOB ARE AS DIFFICULT AS THOSE ENCOUNTERED ON ANY CONSTRUCTION JOB EVER DONE IN THE UNITED STATES OR FOREIGN TERRITORY. MEN HIRING FOR THIS JOB WILL BE REQUIRED TO

WORK UNDER THE MOST EXTREME CONDITIONS IMAGINABLE. TEMPERATURES RANGE FROM 90° ABOVE ZERO TO 70° BELOW ZERO. MEN WILL HAVE TO FIGHT SNOW, WIND, RAIN, ICE AND COLD. MOSQUITOS, BEES AND GNATS WILL NOT ONLY BE ANNOYING BUT WILL CAUSE BODILY HARM.

IF YOU ARE NOT PREPARED TO WORK UNDER THESE AND SIMILAR CONDITIONS DO NOT APPLY

Bechtel-Price-Colligan

EQUIPMENT
that can't work
under these conditions
needn't apply!"

LOOK at that sign! • 800 miles of the world's worst wilderness—mud, snow, water, bitter cold, danger! Equipment that can't work under these conditions need not apply. • Whether it's man or machine, the conditions are the same, and dependability is absolutely paramount for success. Only the best survive the wilderness. • Northwest proved themselves long ago in the Canadian "Bush." • They have seen service from Alaska to Labrador on Canada's biggest rock jobs and they have met the cold and muskeg above the Arctic Circle. • The Canol Pipe Line is another one of the many rush jobs that proves the old Northwest axiom that better machinery means dependability, lower cost operation and greater output. Talk to the men who, in this emergency, are using all types of equipment. It's the machinery that is built to do a job—not built to a price—that is coming through.



ASK how
the NORTHWESTS
are doing!



-and
when you have
a real Rock Shovel
you won't have
to worry about
output in dirt

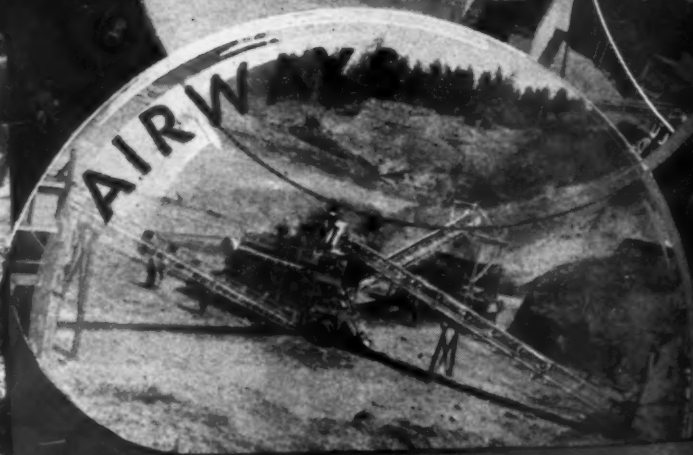
NORTHWEST ENGINEERING CO., 1727 STEGER BLDG., 28 E. JACKSON BLVD., CHICAGO 4, ILLINOIS

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

You can always get
CEDAR RAPIDS
Equipment for
Essential civilian needs


The Armed Services
still come
First!



The Iowa Line

of Material Handling Equipment Includes

- | | | |
|--------------------------------------|---------------------------|------------------|
| Rock and Gravel Crushers | Feeders - & Traps | Traveling (Belt) |
| Belt Conveyors - Steel Bins | Portable Power Conveyors | Plants |
| Bucket Elevators | Portable Stone Plants | Drag Scrapers |
| Vibrator and Revolving Screens | Portable Gravel Plants | Washing Plants |
| Straight Line Rock and Gravel Plants | Reduction Crushers | Tractor-Cranes |
| | Batch Type Asphalt Plants | Steel Trucks and |
| | | Kubit Impact |



EVEN THOUGH we're still making aggregate plants for the Army, Navy and for Lend-lease we can accept your orders for more Cedarapids crushing and asphalt equipment. Just tell us your needs and priorities are necessary. Just tell us your needs and we'll help you with the priority forms and engineer the equipment to fit your requirements.

Manufacturing facilities and engineering skill which produced and are producing aggregate plants for war use, at such an unprecedented rate, can also be used for essential civilian production. The performance of Iowa plants in producing the aggregates which made America strong means lower cost and better performance on your contracts for highways, airports, dams, and other construction.

The Cedarapids line is complete and will meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or a single piece of equipment.

Be sure you come to headquarters for aggregate producing equipment first. See your Iowa dealer or write direct.

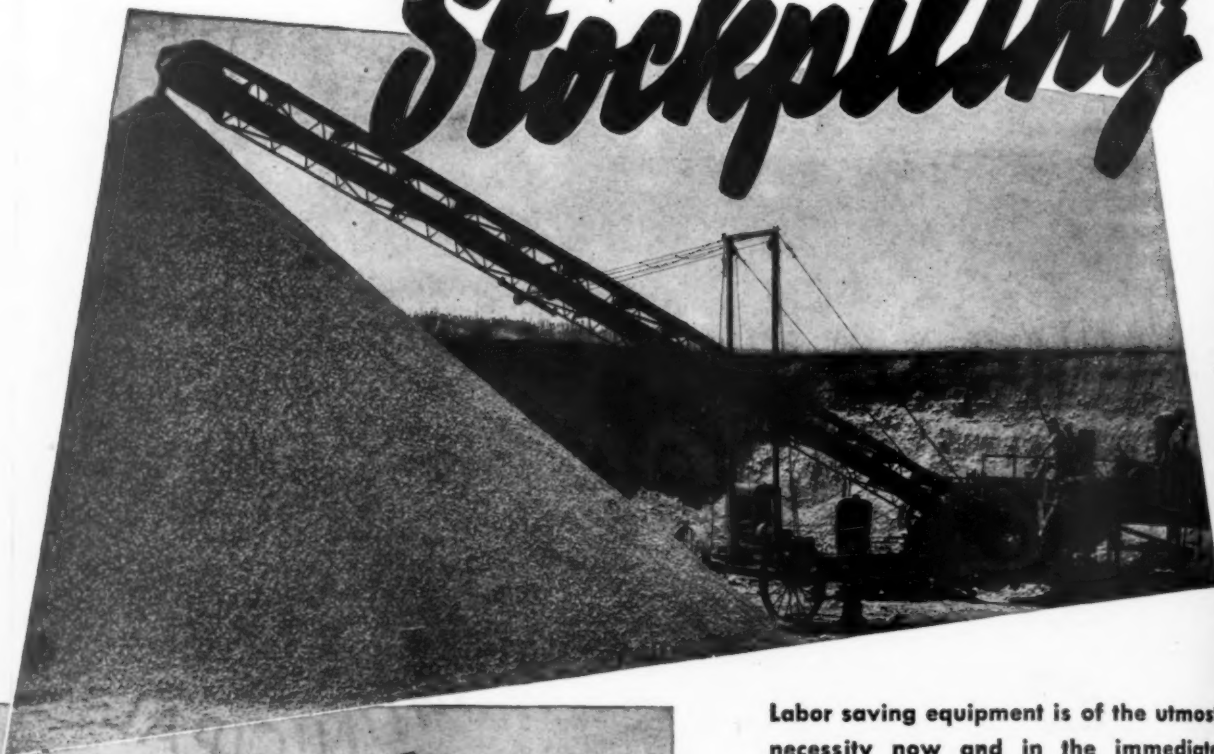
Cedarapids

Built by
IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

Stockpiling



Labor saving equipment is of the utmost necessity now and in the immediate months to come. To meet this need, WPB has released a limited schedule of Barber-Greene Model 82-A Bucket Loaders and Wheel Mounted and Permanent Belt Conveyors.

Preparation of aggregate and stock piling sized material is greatly facilitated with Barber-Greene Permanent and Portable Belt Conveyors. Reclaiming from stock piles is speeded up using the high capacity Model 82-A Bucket Loader, requiring less idle truck time. Often truck drivers easily fill in as loader operators loading their own trucks.

Barber-Greene engineers can assist you in utilizing your present equipment to its fullest advantage, as well as suggesting new equipment if it is necessary. Write to Sales



Engineering Department,
Barber-Greene Company,
Aurora, Illinois, U.S.A.

44-24

BARBER-GREENE

AURORA ILL.

ANSWER THIS

SOS



YOUR COUNTRY DESPERATELY NEEDS IDLE EQUIPMENT

Even with the greatly expanded construction equipment industry producing **FOUR TIMES** its pre-war rate . . . there is still a serious shortage of construction equipment. Nearly all new machines go directly to our armed forces overseas, even a large number of used outfits. As military operations expand, and additional territory is reclaimed from the Axis, more and more will be needed. Besides this — vital industries are in desperate need of tractors, graders, shovels, cranes and other units.

Here is a chance to actively support the war effort — rent or sell idle machines to essential users. Apply for authorization at

your nearest WPB office . . . or make the deal through your Allis-Chalmers dealer. He will buy your equipment and see that it is directed into war work. No authorization is required on sales to dealers.

"Your equipment was not built to become a monument of idleness. It was built to do a job. Its use is constructive and every effort should be made to see that the maximum amount of good comes from its existence on the home front at this time. We cannot afford the luxury of idle equipment stored away and waiting for peacetime work".*

*H. M. Hale, Director of WPB Construction Machinery Division, Equipment Bureau.

TAX RELIEF!

Special tax relief benefits are obtained on the gain from the sale of used construction equipment. Get all the facts from your Collector of Internal Revenue.

- ★ Buy War Bonds
- ★ Save Waste Paper
- ★ Turn In Scrap Metal
- ★ Be A Blood Donor
- ★ Pay Only Ceiling Prices

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

MISSISSIPPI WAGON

NOW IN PRODUCTION



BIG NEWS FOR CONTRACTORS

The MISSISSIPPI WAGON is in the news again! Production is under way on new MISSISSIPPI WAGON hauling units, complete with tractors. They are being manufactured in the following sizes:

Model 75— 9½ yards heaped capacity.

Model 85—10½ yards heaped capacity.

Model 120—15 yards heaped capacity.

Model 75 is designed strictly for construction work. Model 85 is designed for topping contractors; also hauling gravel for state highways, counties, cities and similar users, for long haul work. Model 120 is designed for coal hauling and other light-weight materials. All models have a maximum payload of 26,000 pounds.

The three Models of MISSISSIPPI WAGONS are each powered by the M-R-S Manufacturing Company Special International Diesel Wheel Tractor of 72 Horsepower.

THE WORLD'S MOST MODERN HAULING UNIT CAN MAKE MONEY FOR YOU BECAUSE:

The MISSISSIPPI WAGON has maximum tractive ability for bad going at slow speed without paying the penalty of the pounding and surging of the heavy trailer on the tractor during the high speed portion of the cycle.

This is accomplished by a finger tip control that actuates the hydraulic cylinder between the rear of the tractor and the front of the trailer, thereby causing the transfer of sufficient weight from the trailer to the tractor to secure the maximum tractive effort of the tractor.

NO PART OF THE WEIGHT OF THE LOADED TRAILER is on the tractor except when needed for traction purposes.

Since the tractor is not subjected to the pounding and surging of the heavy trailer at high speeds, repairs are held to the minimum.

The tractor can be quickly detached and used for other work, such as pulling sheepsfoot rollers, rubber tired rollers, etc.

Only 12 pounds of air is necessary in the four drive tires of the tractor, insuring good tractive effort after the load is dumped or when the tractor has been detached and is being used for other work.

The repairs necessary to keep the MISSISSIPPI WAGON in operation are small in quantity, and unbelievably low in price.

Contact your nearest International Industrial Power Distributor for the complete facts about the MISSISSIPPI WAGON, the world's most modern hauling unit.



First-Class Fighting Machine

TALK to a fighting man back from battle and you'll hear him speak of "Caterpillar" Diesel equipment with affection. He knows that, out there, when they need "workpower" they count on "Caterpillar" Diesels. War dramatizes the dependability of these husky power-plants. For a single power failure may cost lives.

It was in the years before the war on the highways, on construction jobs, in logging camps and oil fields and on farms that "Caterpillar" Diesels matched their dependability against the toughest kinds of jobs that could be found.

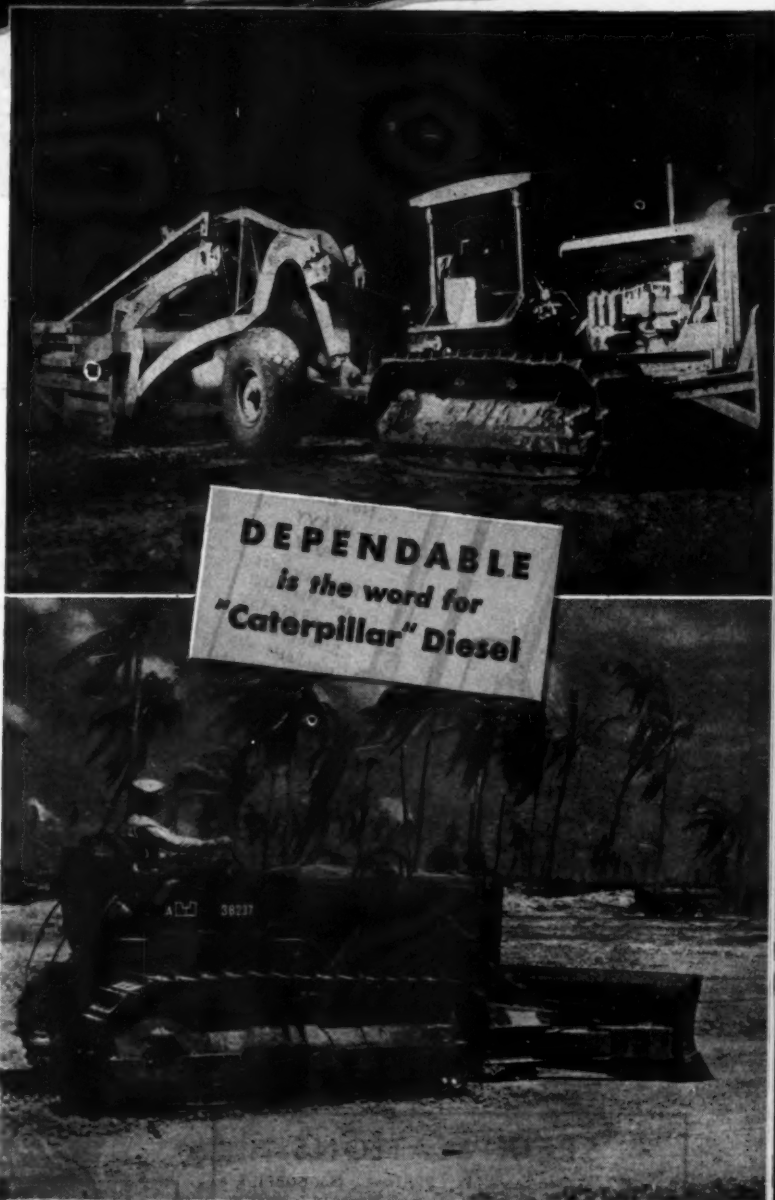
Through those years, the men who built them were watching them perform. Owners of "Caterpillar" equipment were urged to give it more and harder work to do. After many thousands of hours of service, engines were torn down and studied. At the first sign of an on-the-job weakness—no matter how slight—"Caterpillar" trouble-shooters went after it . . . and corrected it!

So, when the armed forces asked for dependable power, it was just a question of stepping up production of the same machines which had been proved over so many years.

When the war is done, the biggest production of "Caterpillar" Diesel Tractors, Motor Graders, Engines and Electric Sets in all history will be ready to tackle the countless tasks that peace will bring. They won't be streamlined "dream" models, but they will be modern, battle-tested "Caterpillar" Diesels—the same kind that are with our troops around the world today.

Meanwhile, your "Caterpillar" dealer is equipped to render complete and efficient service to help keep your present "Caterpillar" equipment on the job—working at peak efficiency.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS



CATERPILLAR DIESEL

TO WIN THE WAR: WORK—FIGHT—BUY WAR BONDS!



**MAN! THIS TAMPER SURE
HANDLES EASY AND RAMS HARD!**

Thor BACKFILL TAMPERS

**DO THE JOB QUICKER, BETTER...
SAVE MONEY AND MAN HOURS!**

**TAMP...
THEN PAVE
IMMEDIATELY
NO DELAY!**

You can tamp . . . then pave at once when you use smooth running, rapid, powerful-hitting Thor Backfill Tampers. These Thor Tampers ram dirt hard—put it firmly into place to stay! No coming back on a job again and again to backfill, you can lay your paving immediately!



No. 50RRT LIGHT DUTY

Lifts and carries its own weight . . . does not tire the operator. This light duty Thor Tamper will do more work and ram more fill far more effectively than several men with hand tools.

No. 60BFT HEAVY DUTY

For tamping clay and other stiff materials. Strong blows coordinate with the weight of the tool to provide perfect balance for easy handling.



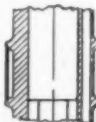
AIR ECONOMY

Simple, efficient Thor Rocker Valve is designed to utilize every ounce of air that enters the machine. Gives long service with minimum wear. Tampers develop powerful blow under 90 pounds air pressure; will operate efficiently on 65 pounds.



POSITIVE LUBRICATION

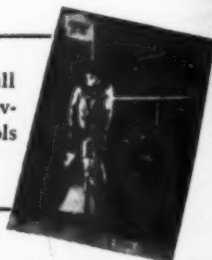
Automatic lubrication system keeps oil distributed throughout the tools constantly. Keeps the valve block spring functioning perfectly. Reservoir holds sufficient oil for a full day's running.



EXHAUST DEFLECTOR

Easily adjustable, simple to operate. Can be turned in any direction to blow the air down and away from the operator's legs.

FOR MORE FACTS about these sure-biting Thor Backfill Tampers and the complete line of associated Thor Paving Breakers, Rock Drills, and other contractors' tools write today for Catalog 42-A.



SPECIFICATIONS

	No. 50RRT	No. 60BFT
Bore of Cylinder	1 1/4"	1 1/2"
Length Overall	48 1/4"	49"
Weight	22 lbs.	29 lbs.
Equipment	5" Dia. Rd. Mall. Iron Butt	6" Dia. Rd. Mall. Iron Butt

Thor

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

"Soldiers"

**TODAY..
MARION**



shovels and draglines
are digging their way
to VICTORY on all
fighting fronts.

"Civilians"

**TOMORROW..
MARION**

machines will be back
again after the war,
with added features,
to help you make
money on those post-
war contracts.

**WHAT ARE YOUR
PLANS? LET'S
DISCUSS THEM.**

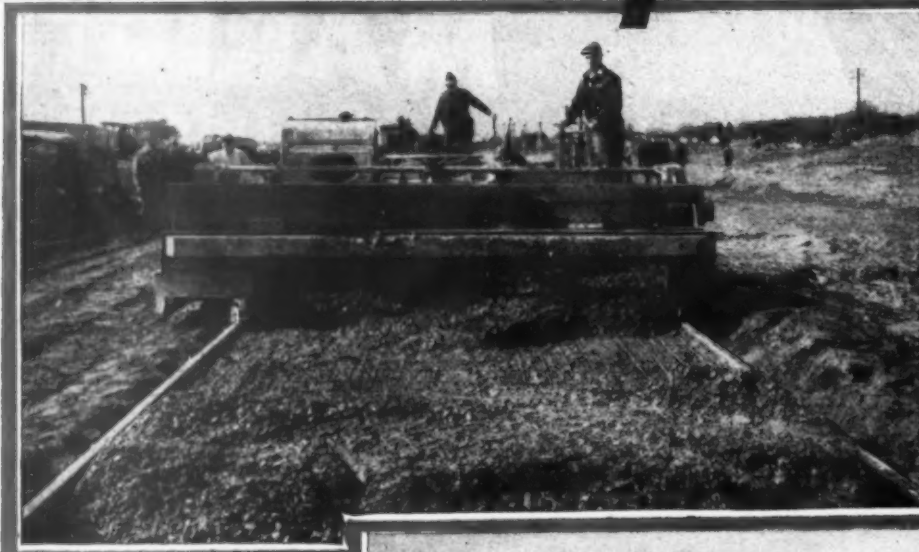
CRANES • PULL-SHOVELS
CLAMSHELLS • SHOVELS
DRAGLINES • WALKERS

For Every Material
Handling Job



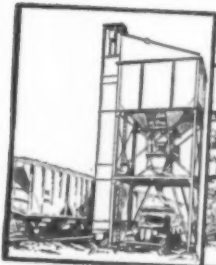
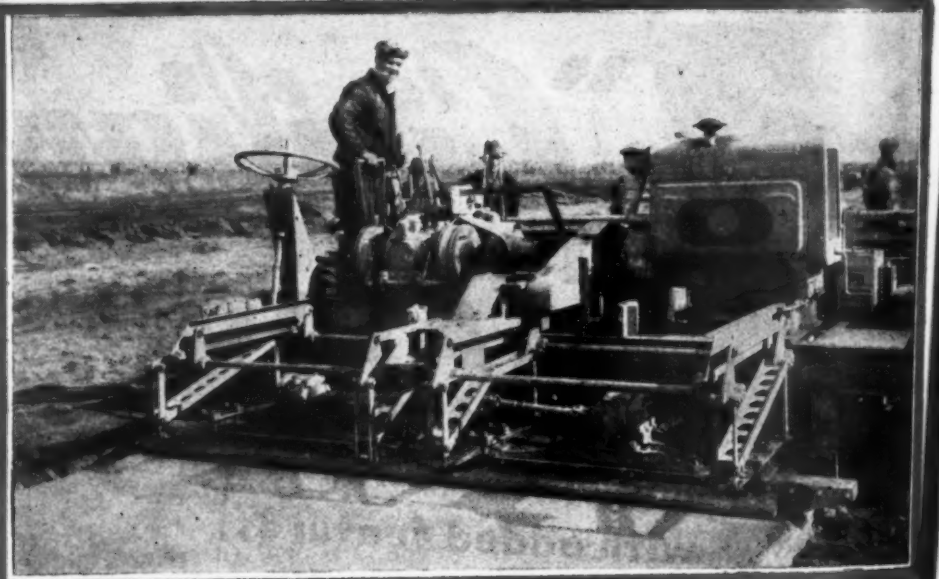
THE MARION STEAM SHOVEL CO.
MARION, OHIO

Use this up-to-date

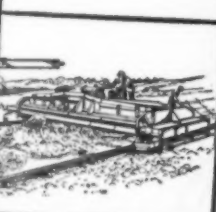


Dry, harsh, concrete paving mix being handled by Blaw-Knox Transverse-Blade Automatic Type Concrete Paving Spreader equipped with vibratory attachment. Concrete tested $\frac{1}{2}$ to $\frac{3}{4}$ inch slump. Contractor's production in spite of difficult concrete was in excess of 400 lineal ft. of 12 ft. wide slab 9" thick per hour. Spreader-Vibrator is one man operated. Vibration increased strength of concrete by 25 per cent.

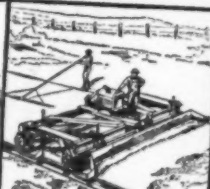
View behind Blaw-Knox Spreader-Vibrator shown in upper photograph. Concrete has been spread to required elevation and simultaneously compacted by vibratory attachment. Note uniformly smooth surface behind vibrator. Blaw-Knox Finishing Machine worked closely behind Spreader-Vibrator and kept pace easily. Cores drilled from completed pavement showed no honeycomb at bottom of slab or at joints and no excess mortar at surface of pavement.



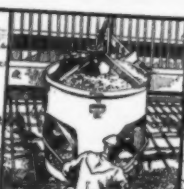
BULK CEMENT PLANTS



PAVING SPREADERS FOR AIRPORTS AND ROADS



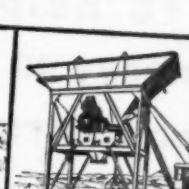
FINISHING MACHINES FOR AIRPORTS AND ROADS



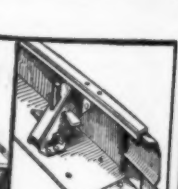
CONCRETE BUCKETS



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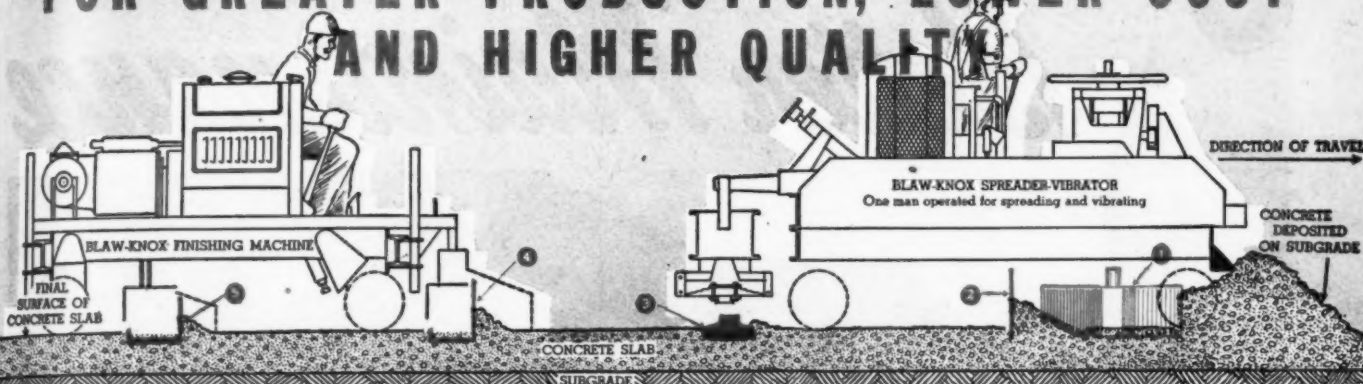
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MAINE
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paving method

FOR GREATER PRODUCTION, LOWER COST
AND HIGHER QUALITY



- 1 Automatic Transverse Spreading Blade spreads concrete transversely and at the same time pushes excess concrete ahead of machine; adjustable for spreading height.
- 2 Finishing Machine front screed strikes off excess of concrete to exact grade and crown. Finisher has easy and rapid operation; follows close behind Spreader-Vibrator.

- 2 Strike-off shapes concrete to required height and crown allowing slight excess for compaction by vibrator; strike-off is hydraulically adjustable for elevation.

- 5 Rear screed of Finishing Machine performs final finishing and smoothing operation.

- 3 Vibratory attachment compacts concrete simultaneously with spreading operation; vibrator is spring suspended and does not rest on side forms. All vibratory effect is transmitted directly to the concrete. Vibrator is controlled by spreader operator and leaves slight excess of concrete for finishing machine.

The method of paving construction illustrated has been proved on hundreds of miles of concrete paving construction for roads and airports.

The dry and harsh concrete mixes frequently specified by engineers for modern pavements can be spread, compacted and surfaced most rapidly and efficiently by the combination of the Blaw-Knox Transverse-Blade Type Automatic Concrete Paving Spreader equipped with vibratory attachment and the modern Blaw-Knox Finishing Machine.

The Spreader-Vibrator spreads the concrete to the required depth and at the same time compacts the concrete by vibration. The Finishing Machine follows close on the heels of the Spreader-Vibrator and does a quick and easy surfacing job. The Blaw-Knox Spreader-Vibrator teamed with the Blaw-Knox Finishing Machine handles the output of two 34-E dual drum paving mixers.

Difficult concrete is easily handled on a production basis by this up-to-date paving method and the contractor gains—in greater yardage, lower construction cost, minimum of manual operations and higher quality paving.

The Blaw-Knox Finishing Machine can also be equipped with a vibratory attachment. However, experience has shown that the paving vibrator mounted on the spreader provides better compaction, more practical operating procedure, and maximum production of paving slab. The Spreader-Vibrator always remains with the paving mixer and does not have to move back to aid in correction of high or low areas.

Blaw-Knox Spreaders and Finishers including vibratory attachments are available in standard sizes as follows: 10-15 ft. adjustable width, 20-25 ft. adjustable width.

Your Nearest Blaw-Knox Distributor Will Promptly and Efficiently Handle Your Inquiries for Construction Equipment.

BLAW-KNOX

**BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY**

2003 Farmers Bank Bldg., Pittsburgh, Pa.
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CORRECT Lubrication **means** *Better Maintenance*



PROBLEM—excessive wear, difficult maintenance.

SOLUTION — *Correct lubrication.*

Sinclair provides highly specialized oils and greases for better lubrication of **CONSTRUCTION MACHINERY**. Sinclair Motor Oils and Gear Lubricants stand up . . . give *safe* lubrication under severe punishment in heavy duty operation.

Sinclair Ten-ol 200 is highly efficient in Diesel engines and Diesel - powered shovels, buckets, and bulldozers.

Is maintenance a worry? Let us tell you how Sinclair lubricants make for *better maintenance*.

(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)

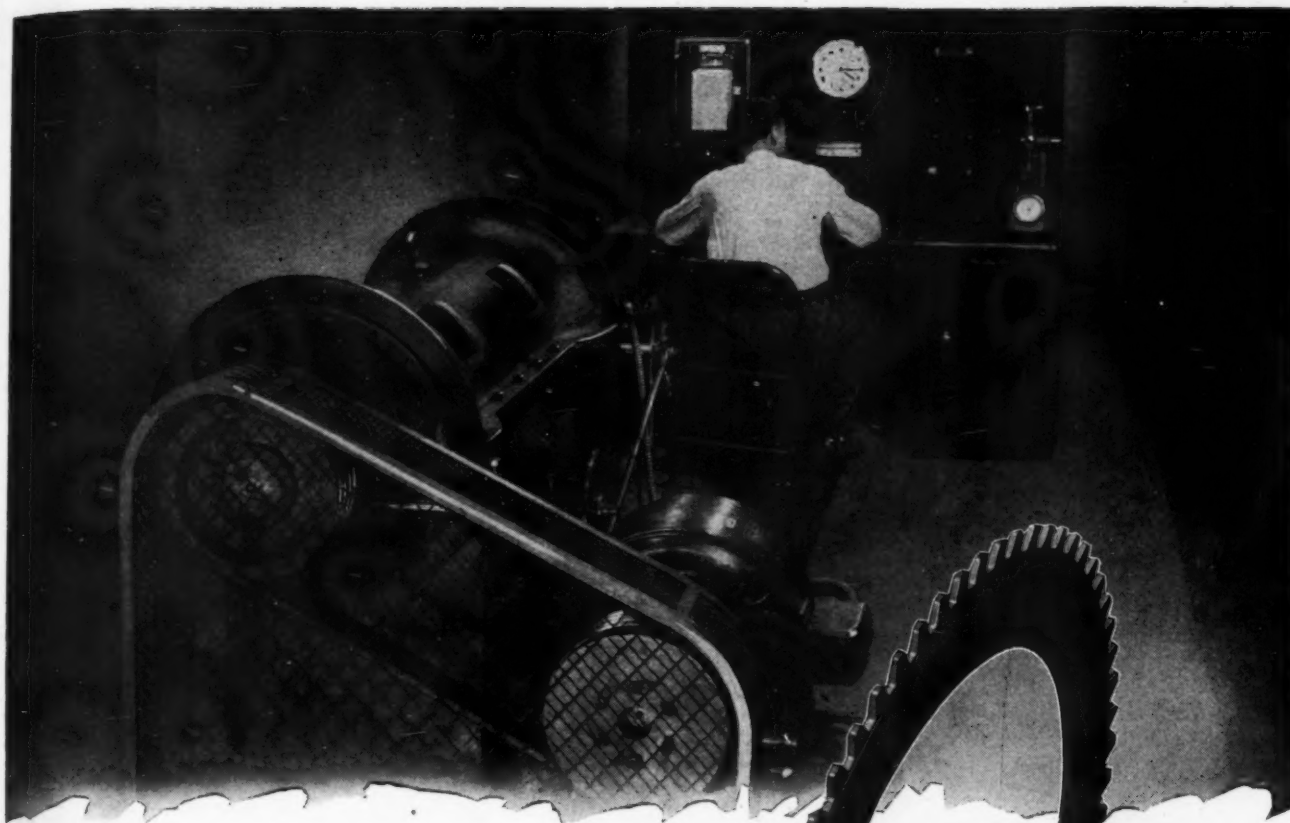
SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.
ROADS AND STREETS, July, 1944

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With
much
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THE

FOR



...to give you BETTER friction materials

The large and well equipped Wellman laboratories are devoted exclusively to testing *rubbing surfaces*. With many different types of dynamometers and much other specialized equipment, our skilled engineers are engaged in continuous study of powdered metal friction materials. The result: Velvetouch clutch facings and brake linings give you the utmost in dependable performance and long wear. Specify Velvetouch for replacements in your tractors, scrapers, shovels and other earth-moving equipment.

THE S. K. WELLMAN COMPANY
1374 East 51st Street • Cleveland 3, Ohio

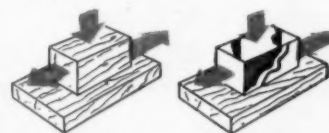
FOR BRAKE AND CLUTCH

USE

Velvetouch

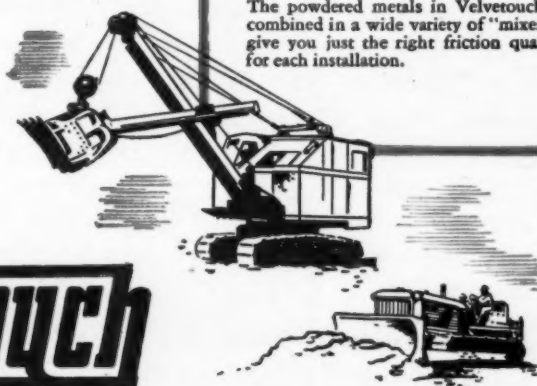
Interesting facts about Friction

Whenever a pair of surfaces rub together, friction is developed which tends to retard the motion. Friction between like bodies is greater than between unlike bodies, hence the reason for steel shafts housed in bronze journals.



Hard wood rubbing against hard wood under certain conditions would have a coefficient of slightly less than .5. On the other hand, lubricated wrought iron on hard wood under the same conditions would have a coefficient of less than .1.

The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give you just the right friction qualities for each installation.



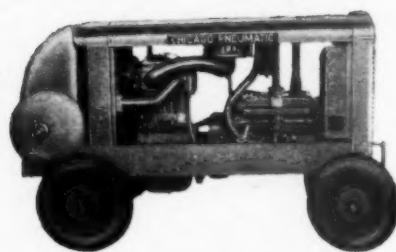
ROADS AND STREETS, July, 1944

Compare Your Equipment with



CP "Construction Equipment" (Catalog No. 600) describes and illustrates the advantages of using CP tools on your contracts. Efficient, dependable air compressors... low air consumption and low maintenance rock drills, concrete vibrators... clay spades... backfill tampers... time-saving wagon drills... these and many other items of money-saving equipment for contractors are described in Catalog No. 600.

Backing up Chicago Pneumatic's very complete line of contracting equipment are many years of successful, profitable use by contractors everywhere. Write for your copy of "CP Construction Equipment."



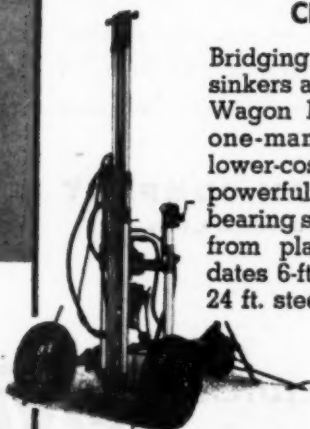
CP PORTABLE COMPRESSORS

Many refinements of design and manufacture give CP Two-Stage, Air-Cooled Portable Compressors exceptionally high efficiency and dependability. They are available with Hercules gasoline engines in sizes of 60, 105, 160, 210 and 315 c.f.m.; with Caterpillar Diesel engines in sizes of 105, 160, 210, 315 and 500 c.f.m.



CP SUMP PUMP

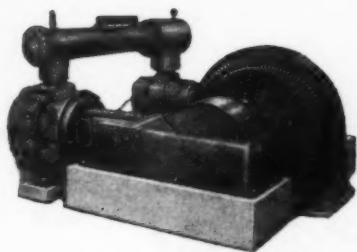
Removes water from man-holes, ditches, tanks or pits quickly and cheaply. Requires no priming. Water-tight casing; muck cannot get into motor. CP Sump Pumps will operate from any air compressor delivering 100 or more cubic feet per minute.



CP WAGON DRILL

Bridging the gap between hand sinkers and the Heavy Duty G-500 Wagon Drill, the G-200 provides one-man operation and faster, lower-cost drilling with the most powerful CP Drifter Drills. Roller bearing steel wheels; easily moved from place to place. Accommodates 6-ft. steel changes and 18 to 24 ft. steels are easily handled.

These CP Profit-Makers!



CP CLASS O-CE STATIONARY COMPRESSORS

Ruggedly built and conservatively rated, CP Class O-CE Horizontal-Duplex Motor-Driven Air Compressors meet every requirement of heavy duty, day-after-day service. Available in capacities up to 10,000 c.f.m. Other CP stationary compressors are available in vertical and horizontal designs for steam, belt and electric motor drive in wide variety of capacities and pressures.

CP 219 PNEUMATIC VIBRATOR

For light, reinforced concrete, 3" slump and over, there is no vibrator faster, cheaper to operate than the CP-219. Ideal for walls and columns under 15" thick, light floor and roof slabs.



CP 3 CLAY SPADE

Light in weight, fast, CP No. 3 Clay Spade is ideal for general digging in soft and medium clay. For digging in hard clay, shale, etc., CP No. 5 Clay Spade is recommended.

CP-MM BACKFILL TAMPER

In trench work particularly, CP Backfill Tampers quickly earn their cost by saving in the time and labor of hauling surplus excavated material. For general tamping, CP-3 Tamper is recommended; for heavy tamping, CP-MM; for extremely heavy tamping, CP-4.



CP-117 DEMOLITION TOOL

The most popular demolition tool in the entire Chicago Pneumatic line. The CP-117 delivers a hard blow but it is so well balanced it has no kick-back and is easy to handle. Recommended for heavy duty work in hard, dense concrete and similar medium-to-extremely hard materials.



CP-42 SINKER DRILL

The low air consumption of CP-42 Sinker makes it ideal for use with portable compressors. Because of its fast drilling speed, strong rotation and exceptional hole-cleaning qualities it is a favorite drill for general excavation and road work.



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AIR COMPRESSORS
VACUUM PUMPS
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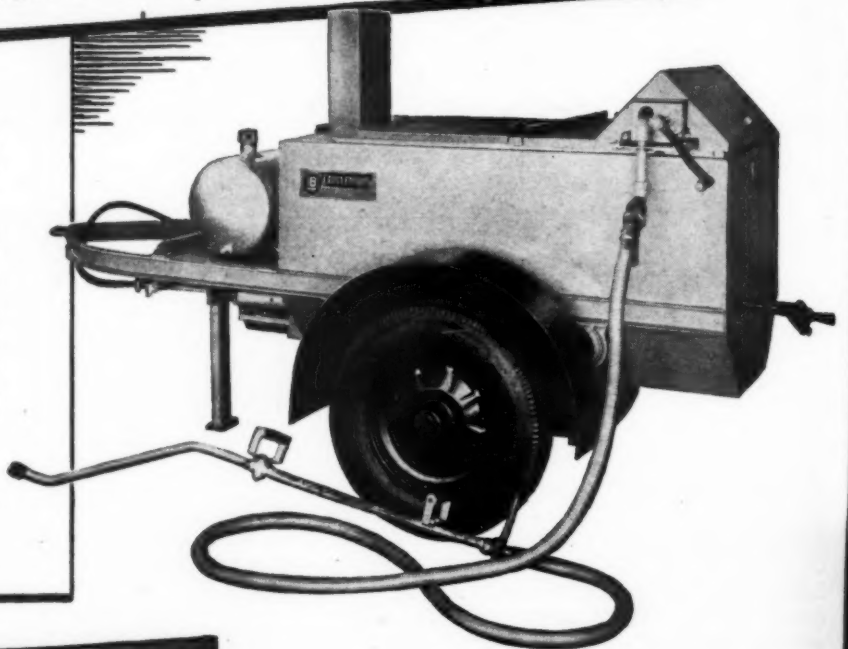
MODEL No. 84-HD

MAINTENANCE KETTLE

Here's the Kettle for post war Road Maintenance. Has two Patented Features that assures greater heat distribution and a constant flow of melted material.

One of these features, "Double Heat Circulation System", utilizes the entire heat from the burner and distributes it evenly throughout the Kettle, giving faster heating. The other, "Screened Reservoir", keeps the cold materials when added from cooling off the already melted material, also forces the new material to the heated sides, making them melt faster.

For an efficient Black Top Road Unit, there is none to equal the Littleford 84-HD Kettle.



↑
When shoulder work is required, the 84-HD with hand spray attachment will do the job. Only two men are required to operate this 84-HD Kettle.

↗
The 84-HD with Motor Spray Attachment is a one-man Kettle. All controls are in the operator's hands. For road repairs, this unit can cut the cost and speed up the work.

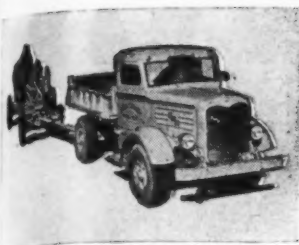
↘
Road repairs such as holes, sub-grade failure, etc., need attention now and post war. The 84-HD Kettle with hand spray or motor spray attachments can save costly repair work if used to keep road in fit condition.



LITTLEFORD

Littleford Bros., Inc.

454 E. Pearl St., Cincinnati 2, Ohio



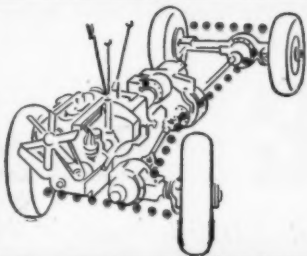
THIS YEAR MORE ROAD MAINTENANCE WITH LESS MANPOWER... DEMANDS MORE *Truck-Power!*

The problem of maintaining America's highways this year, with less manpower available, puts still greater responsibilities upon the equipment available. FWDs can be relied upon to do the many necessary jobs to keep roads conditioned for vital service.

Pulling scarifiers and leaning-wheel graders . . . leveling washboard surfaces, ruts and sinkholes with underbody scraper . . . hauling gravel, sand, asphalt heaters for pavement patching . . . and many other heavy duty road maintenance jobs are "all in the day's work" for FWDs. Rugged, powerful and economical in performance, these modern trucks with power in all four wheels offer more "truck-power" as an effective answer to the problem of less manpower.

Thus keeping America's roads fit for duty, FWDs speed America's inevitable Victory.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis. Canadian Factory: Kitchener, Ontario
The Oldest and Original Exclusive Builders of Four-Wheel-Drive Trucks



**Four-Wheel-Drive... THE BACKBONE
OF RUGGED, DEPENDABLE TRUCK HAULING POWER**

The true application of four-wheel-drive with center differential provides ability to get through under difficult conditions — increased surety and safety on the road — lower operating cost per ton-mile — long service life.



**BUY MORE
WAR BONDS**

IN EVERY FIELD WHERE TRUCK QUALITY IS PUT TO THE TEST, FWD'S STAND UP



COMMERCIAL



CONSTRUCTION



UTILITIES



OIL-FIELDS



MILITARY

ETNYRE U. S. PATENTED SPRAY-BAR

Attains Unequalled Efficiency in Application of Asphalt
Cut-Backs, Tar, Road-Oils, Emulsion . . . In "Black-Topping"

NOTICE

about possible U. S. Patent infringement

At intervals, some "new" spray-bar is presented. Claims are made of how it will improve performance of an owner's distributor if he will buy and put one on his machine.

Etnyre, largest distributor manufacturer, has made more spray-bars than any other producer. Thousands are in use, having applied actually BILLIONS of gallons of asphalt, cut-backs, tar, road-oils and emulsion in YEARS of black-topping service.

Etnyre "Black-Topper" equipment is protected by U. S. Patents with other patents pending.

- Sprays Any Width . . . up to 24 Feet or Wider
- Instant Start or Shut-Off at Every Nozzle

Controls of entire
spray-bar at oper-
ator's fingertip.



FULL CIRCULATION IN BAR . . . NO "FROZEN" ENDS . . . NO CONGEALED LIQUID

Replace Obsolete Spray- Bar On Your Distributor Now

Now is the time you should "modernize" your distributor—bring it up-to-date with an Etnyre Pat'd shut-off-at-nozzles spray-bar . . . and thus be ready to meet the rigid black topping specifications of Highway Engineers.

It is significant that U. S. Army Engineers, checking ALL makes of distributors and ALL makes of spray-bars chose the Etnyre. In doing this they substantiated the judgment of thousands of road-contractors and Highway Engineers.

Etnyre pat'd spray-bar on YOUR distributor will pay for itself in a short time by better performance; faster and greater output.

Get in touch with your Etnyre dealer . . . or with us. Give full facts . . . model, year and size of your distributor.

The reason why the Etnyre "Black-Topper" is the most widely-used of all bituminous distributors is that it is the distributor which correctly coordinates FOUR FUNCTIONS SIMULTANEOUSLY—

1. Heats liquid to proper temperature; maintains it.
2. Pumps liquid from tank through circulating system to spray-bar.
3. Circulates liquid to and through the spray-bar.
4. Sprays liquid with precise accuracy and uniformity which may be varied from 1/10th gal. to 3 gals. per square yard . . . in widths to 24 feet, on flat surfaces, grades, and crowns.

This liquid may be asphalt, cut-back, tar, road-oil or emulsion . . . from the heaviest to the lightest. It must penetrate, under proper pressure, into heavy aggregates . . . or a lighter application on gravel . . . or a finishing "seal coat." Each square yard applied with utmost uniformity . . . and each yard completely accurate as to amount.

Etnyre Pat'd spray-bars . . . as used by U. S. Engineers on hundreds of Etnyre "Black-Toppers" now in war service . . . make possible this performance, unequaled by any other distributor, or by any other spray-bar.

On the Etnyre pat'd "shut-off-at-nozzles" spray-bar each nozzle may be stopped or started instantly . . . as many nozzles as desired may be used . . . any place along bar . . . to spray any width . . . any part of the surface. No bar need be removed. Ends fold up for transit. Get facts now from your Etnyre dealer or write directly to us. Get faster, better "black-topping" with an Etnyre.

ETNYRE "Black-Toppers"

The most-widely-used bituminous-materials distributors in the world

E. D. ETNYRE & CO. Founded 1898 OREGON, ILL., U. S. A. 173 Bent Street CAMBRIDGE, MASS.

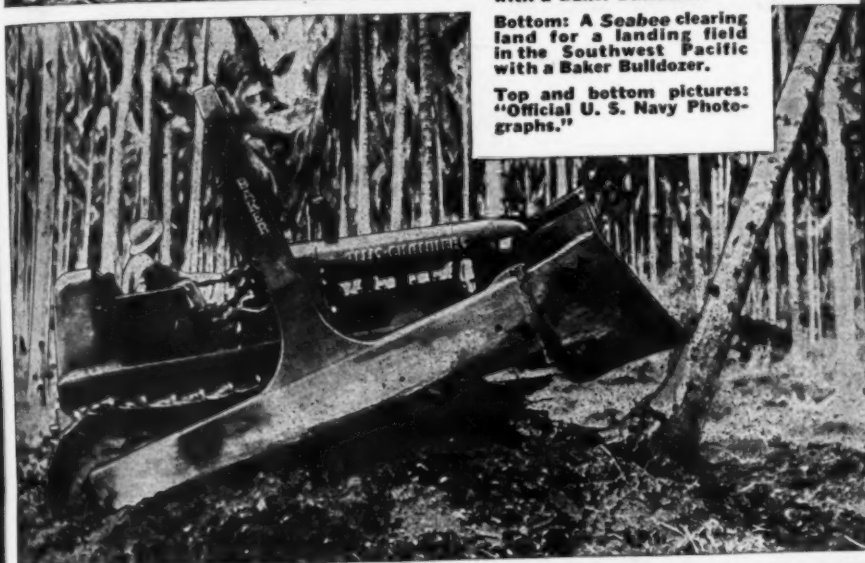


Top: Baker Bulldozer-equipped tractor compacting runway with sheepfoot rollers on a Southwest Pacific Island.

Center: Tree dozing for a landing strip at Guadalcanal with a Baker Bulldozer.

Bottom: A Seabee clearing land for a landing field in the Southwest Pacific with a Baker Bulldozer.

Top and bottom pictures: "Official U. S. Navy Photographs."



SEABEES USE BAKERS TO BEAT JAPS ON SOUTH PACIFIC ISLANDS

Tree Dozing, Leveling and Grading Speeded to Completion

Hogging out landing strips and airports on South Pacific islands, despite almost continuous air and land attack, was speeded to completion with Baker Bulldozers and Gradebuilders. Seabees, U. S. Engineers and other construction units used these versatile tractor units to hasten many construction jobs.

Tree dozing and jungle clearing, road building, leveling and grading landing strips and air fields—all were taken in stride and speedily finished.

Top Brace Is Safety Factor

In jungle dozing, the overhead brace on Bakers was found to be a valuable safety factor as falling palmetto and other trees could not fall on top of the tractor operator. Flexibility of blade lift made tree dozing simple as hydraulic control allowed for inching the blade up the tree trunk for increased leverage pushing after the fall was started.

Hydraulically operated blade control, full down-pressure and smooth lift simplified grading and leveling despite the inexperienced operators, adding to speed of operations and quality of construction.

Bulldozer-equipped tractors were also widely used for pulling sheepfoot rollers and other equipment and for hauling loaded wagons and trailers.

THE BAKER MFG. CO.

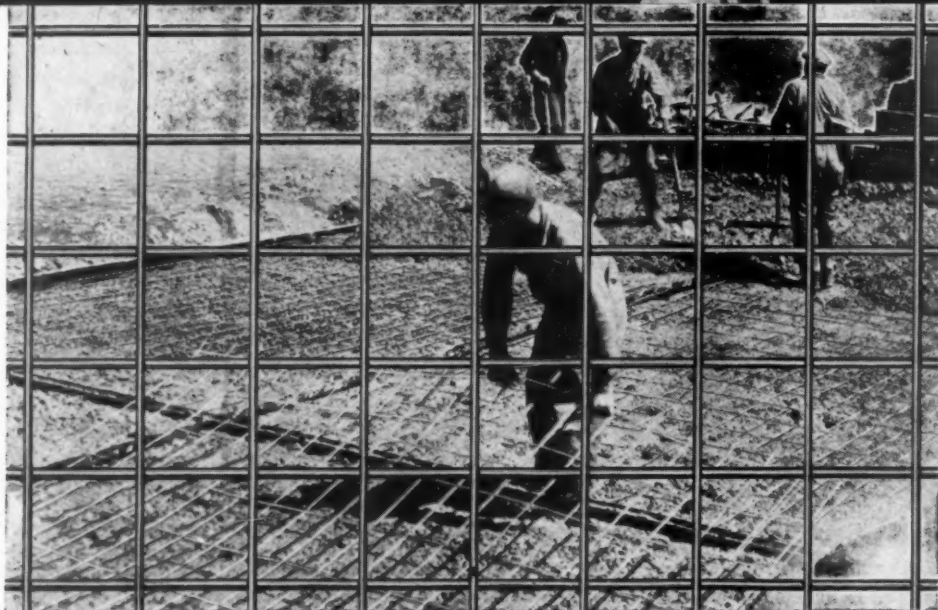


ROADS AND STREETS, July, 1944

Great Concrete Bridges



depend upon steel
for
reinforcing strength!



STEEL—for roads that endure!

Great and graceful spans of concrete for practical use could not be constructed without steel reinforcing. Tremendous stresses, high fills subjected to earth movements, exposure to extremes in temperature—protection against these destructive forces is assured by steel reinforcing.

For many years, concrete reinforced with Truscon Welded Steel Fabric has been an accepted and proved formula for road permanence. Engineers and designers know by research, practice and experience, that the following advantages can be secured from Truscon Welded Steel Fabric Reinforcement.

1. Provides resistance to cracking due to shrinkage of concrete during setting period.
2. Provides tensile strength necessary to resist subgrade friction caused by expansion and contraction of the concrete slab due to temperature changes.
3. Provides increased resistance to cracking of concrete due to warping under load.
4. Provides resistance to the development of microscopic cracks into visible cracks.
5. Provides resistance to cracks opening and allowing the entrance of water.
6. Provides resistance to broken ends of slabs separating at a crack.
7. Decreases spalling and progressive disintegration of the concrete.

When you plan roads, plan them well. Use structural designs that have been proved the most economical, durable and serviceable in the *long run*. Use Truscon Welded Steel Fabric with other associated Truscon roadbuilding products, and assure lasting prestige for you and more permanent highways for the communities you serve.

TRUSCON

Steel Company

YOUNGSTOWN 1, OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION

ROADS AND STREETS, July, 1944

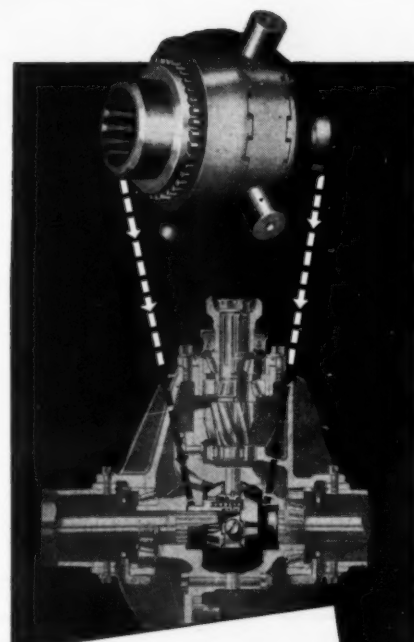


NO MORE STUCK TRUCK BITTERS

WHEELS move and pull when the Thornton *Automatic-Locking* Differential is installed in the driving axle of a truck. You get positive traction through mighty tough ground conditions such as deep mud, muck, sand, plowed ground, snow or over ice. It gives astounding *traction* performance. It stops wheel spin because *both* driving wheels *must* rotate when power is applied.

Thoroughly war-tested, the Thornton Differential can quickly pay for itself in savings of rubber, gas, chains, manpower, towing costs, and lost delivery time.

For better traction . . . long life . . . maintenance of time schedules, and a greater degree of driving safety, install **THORNTON *Automatic-Locking* DIFFERENTIAL** in city coaches . . . school buses . . . snow plows . . . tow trucks . . . fire trucks . . . farm trucks, etc.



*Investigate
the Advantages*

Ask for free descriptive booklet giving full particulars on sizes now available to essential civilian users and how to order them. Write... Wire... Telephone.

MODELS AVAILABLE

- Model 10G1 for Ford 1½ ton trucks with single speed axles.
- Model 20G1 for Chevrolet 1½ ton trucks with single speed axles.
- Model 50G1 for International Trucks (Model K-3) with single speed axles.
- Model 50G2 for International Trucks (Models K-4 and K-5) with single speed axles.
- Model 50J1 for International Trucks (Models K-6 and K-7 or earlier equivalents) with single speed axles.
- Model 40G2 for G.M.C. Trucks (Models 350, 400 and T18) with single speed axles.

THORNTON TANDEM CO.

8759-C GRINNELL AVENUE • Plaza 9700 • DETROIT 13, MICHIGAN

"Make Big Trucks Out of Little Ones" with the THORNTON Four-Rear-Wheel DRIVE

In U. S.: Sold by

TRUCKSTELL DISTRIBUTORS

In Canada:

H. V. WELLES, LTD., Windsor, Ont.

THORNTON TANDEM CO.

8759-C Grinnell Ave., Detroit 13, Mich., U.S.A.

Please send me data on your *Automatic-Locking* Differential.

Name

Address

City..... State.....

Make and Model Year.....

ARE YOU CURIOUS ABOUT "POSTWAR" TRAILERS?



Here is Fruehauf's Position On the Subject

EVERY DAY, in Fruehauf's Experimental Department, men are putting into form the improvements for civilian Trailers developed by our designing engineers.

That's been going on for years, of course, but war has stepped up the pace—because, in developing over 100 different types of Trailers for military use, our engineers have found scores of ways to improve commercial units, too.

And the thing that's most important to you is that these improvements are made available to you just as soon as possible after they are perfected.

That means immediately in many cases. But sometimes it may mean a delay of weeks or months. And some improvements may have to be "shelved" until war is over. The availability of tools, machines and materials controls that.

Certainly your "postwar" Fruehauf will be a better Trailer than the one you get today. It would be better under normal circumstances, just as this year's Fruehauf is a better product than last year's.

How much better it will be is, of course, something which cannot be answered at this time. It depends upon how many improvements already perfected must await the war's end before we can pass them on to you—and it depends, also, upon what the manufacturers who supply us with materials and parts develop for us.

But this you can be sure of:

Insofar as we are able to do so, we will continue to incorporate in the design and construction of Fruehauf Trailers all improvements as they are perfected.

There is nothing in the immediate postwar picture now which gives us any reason to expect a

startling unveiling of radically new postwar models.

Improvements will be made as we go along; nothing will be kept back from you voluntarily—above all, the element of surprise will have no part in our planning.

You buy Trailers—and we build them—for only one purpose: to cut your haulage costs. And we believe we are justified in assuring you that the Fruehauf you buy—whether it is today, next month or next year—will give you a better-than-usual return on your investment.

This year we have been authorized to build some 12,000 Trailers for civilian use. Naturally, this does not compare with our peacetime volume or with the demands of the industry, but it is sufficiently large to enable us to "tool up" now for many improvements which, on the basis of smaller volume, would have to wait until normal peacetime production is resumed.

AN ENTIRE PLANT PRODUCING FRUEHAUF CARRYALLS

Since shortly after Pearl Harbor the manufacturing capacity of one entire Fruehauf factory has been devoted exclusively to the production of Carryall Trailers for military service. These extensive facilities will enable Fruehauf Carryalls to render vital and immediate service in the gigantic construction program that awaits the dawn of peace.

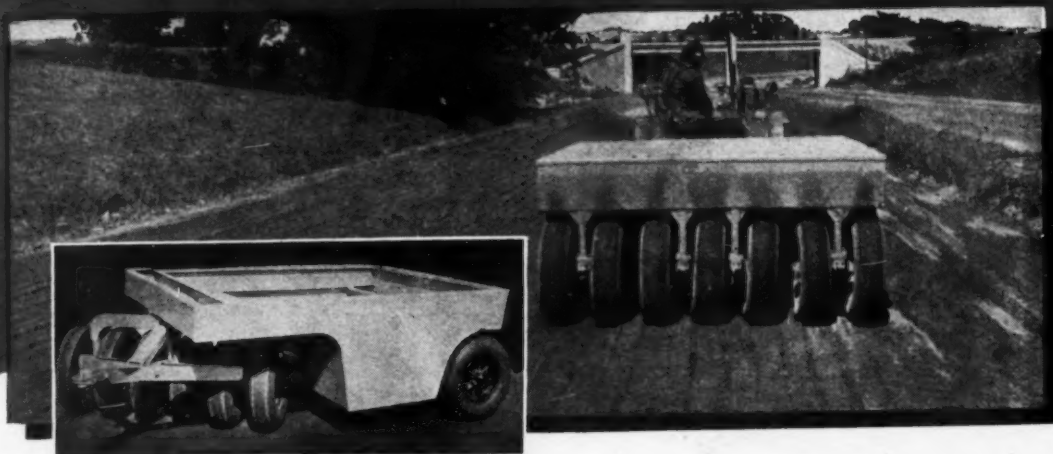
World's Largest Builders of Truck-Trailers

Service in Principal Cities

FRUEHAUF TRAILER COMPANY • DETROIT 32

It's all in the Action!

VOIDS ELIMINATED—COMPACTION INCREASED
with **BROS WOBBLE-WHEEL ROLLERS**



NOW AVAILABLE FOR IMMEDIATE DELIVERY!

Because of our ability to meet all production requirements of the U. S. Service Forces, Bros is also permitted by W. P. B. to produce a limited quantity of Bros Wobble-Wheel Rollers for civilian needs, subject to W. P. B.—1319 release from limitation order L-192. Write, wire or phone for illustrated literature and complete details.

Road Machinery Division

WM. BROS BOILER & MFG. COMPANY

MINNEAPOLIS 14, MINNESOTA

BROS *Wobble-Wheel* **ROLLERS**



SNOW PLOW
ALL TYPES

GRADING
TRANSMISSION

GRADING
TRANSMISSION

GRADING
TRANSMISSION

GRADING
TRANSMISSION

GRADING
TRANSMISSION

KEEPS TRUCKS OUT OF THE SHOP AND ON THE ROAD



INTERNATIONAL Truck Service *Heads Off Trouble*

Got truck trouble? Want to save time and money and get the last possible pay-ounce out of your trucks? Then use International Truck Service. Furnished by International Truck dealers and branches—coast to coast.

NEW TRUCKS LIMITED!

The government has authorized the manufacture of a limited quantity of trucks for civilian hauling in essential occupations. But don't count too much on getting these trucks. Meanwhile, make sure every ounce of maintenance protection is given the Nation's trucks.

International Truck Service keeps trucks where they should be, on the road, delivering loads on time and at a profit. It finds and corrects little troubles before they become big ones. It uses genuine International parts, which wear better and

These truck branches form the nation's largest Company-owned truck service organization. They are truck *bases*, stocked with parts, equipped with special inspection tools and repair and reconditioning machines, and wise in the know-how of finding and fixing hidden snags that can cost you time and money later.

fit better because they are just like the originals.

Save yourself grief, time and money by going now to an International Truck dealer or branch and arranging the kind of service that keeps trucks on the job.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Ill.

INTERNATIONAL Trucks

PRODUCING BALLAST AT RAILSIDE PITS

Saves ton-miles in hauling



Because of the record volume of war-time traffic, the shortage of cars and labor, railroads are faced with new ballast problems. They must secure more and better ballast, at lower costs, with shorter hauls and speed up ballasting operations.

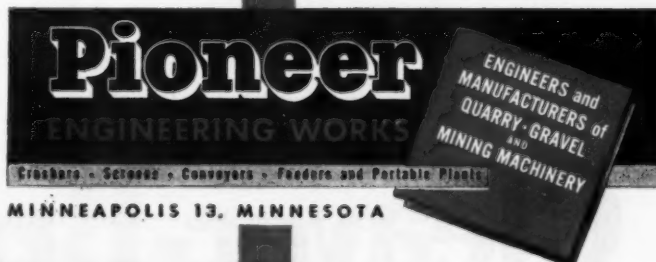
The answer to these new demands was found by one railroad by producing ballast at railside pits with a portable plant.

A Pioneer Portable plant was selected by the contractor E. W. Wylie Co., Inc., of St. Paul. It meets all the requirements of the job. It is easily moved to railside pits. It is producing approximately 125 yards of ballast per hour from pits containing 40% oversize. The railroad is receiving a better quality of ballast, at a saving over the cost of commercial gravel, plus savings in rail haul and use of cars.

This Pioneer Portable ballast plant consists of a loading hopper equipped with mechanical feeder, a 1536 primary jaw crusher and power unit mounted on truck and a 38 V Pioneer crushing, screening, loading plant mounted on a railroad flat car. A belt conveyor loads a gondola on parallel track every 17 minutes. In moving from one pit to another, the primary crusher and the conveyors are loaded on another flat car.

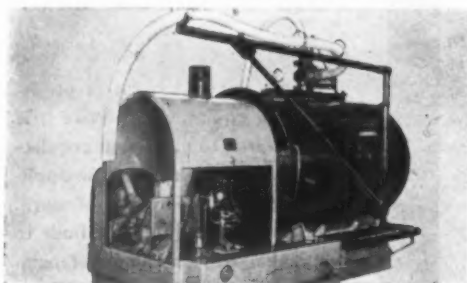
The E. W. Wylie Company is equipped for modern methods of producing ballast through wide flexibility of operation. Because their Pioneer plant is readily portable it is moved easily to various pits each accessible to ballasting operations—and because the plant is a Pioneer they can produce any size or variation of crushed product at the lowest dollar cost.

● Pioneer equipment is profit-making equipment because it is engineered to meet your requirements for either a specific application or a wide range of work. It is durable equipment built to function with a minimum of maintenance. Planning with Pioneer involves no obligation. Regard its complete service as an ally of your business which is always available. Detailed literature on any Pioneer products furnished promptly.





Mobile tank-car heater available in two and three tank-car sizes. Oil-fired with exclusive design four-pass flue travel; dry-coil steam condensate return under pressure — no water or heat loss.



Portable pumping booster. Heats by direct firing in one operation loading directly to distributor, relay truck or returning to tank-car. Available in 2 sizes—truck mounting or 4 wheel trailer.



Truck mounted pumping booster in service of Oklahoma Bituminous Distributing Co., Ada, Okla.

FOR MORE PRODUCTIVE HOURS FROM BITUMINOUS HEATING EQUIPMENT...RELY ON CLEAVER-BROOKS DEPENDABILITY AND DURABILITY

☆ Most of the pioneer models of tank-car heaters, built by Cleaver-Brooks fourteen years ago, are still in service.

☆ There are more Cleaver-Brooks tank-car heaters and bituminous boosters in both civilian and military service than all other makes of similar equipment combined.

☆ Service records from hundreds of owners prove Cleaver-Brooks dependability and durability. Cleaver-Brooks equipment is usually assigned to the difficult jobs — the hardest chores—because of its known capacity and reliability.

☆ The design and construction of Cleaver-Brooks heating equipment is subject to constant check — to include every feature that contributes to the most effective performance and long service life.

☆ Cleaver-Brooks heaters are the "finished" product of the pioneers and originators of tank-car heaters and bituminous boosters—built by specialists in the construction of portable and stationary steam generators for construction, industrial and military uses.

On your next bituminous heating equipment purchase you can expect and get more from Cleaver-Brooks—qualified by experience and facilities in this specialized field.

CLEAVER - BROOKS COMPANY
5106 N. 33rd Street • Milwaukee 9, Wisconsin



Cleaver-Brooks

PIONEERS AND
ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM PLANTS

ROADS AND STREETS, July, 1944

TEN-STRIKE IN POWER



A *ten-strike* is defined as "any successful and decisive stroke or act." That's why we call the modern, high speed Cummins Dependable Diesel a "ten-strike in power." For in every heavy-duty service—automotive, industrial and marine—Cummins' development of the high speed diesel (beginning in 1918) has proved to be a successful and decisive factor in reducing power costs to a new low . . . raising profits to a new high! CUMMINS ENGINE COMPANY, INC., Columbus, Ind.



SINCE 1918...PIONEER OF PROFITABLE POWER
THROUGH HIGH SPEED DIESELS



HEAVY-DUTY MODELS FOR AUTOMOTIVE AND INDUSTRIAL SERVICE

ROADS AND STREETS, July, 1944



HOW AIRFIELDS GROW ON MUCK, ON SAND, ON TUNDRA

ON world-wide battle fronts America's planes are taking off on missions against the enemy—taking off from desert sand, jungle muck, or Aleutian tundra.

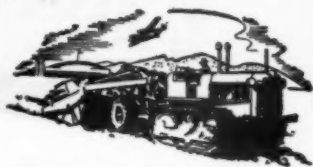
In a matter of days, bulldozers shove aside the muck or level the sand. And giant cranes lay steel landing mats that are bolted into a landing strip.

Look at the engines in these bulldozers and cranes. You'll find familiar friends—the same friends

that power tanks and trucks, landing barges and patrol vessels, tractors and auxiliaries—General Motors Diesels.

And in these rigorous jobs of war, a promise is being written—a promise of plentiful, dependable, easily maintained, low-cost power for America's needs in the peacetime days ahead.

Tomorrow



Reconstruction and new construction are going to need plenty of this hard-hitting, easy-on-the-fuel power. With normal refinement and development speeded up by war, with production expanded, GM Diesels will be ready to serve in more fields and in more ways than ever.



ENGINES... 15 to 250 H.P. DETROIT DIESEL ENGINE DIVISION, Detroit, Mich.

ENGINES... 150 to 2000 H.P. CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

LOCOMOTIVES... ELECTRO-MOTIVE DIVISION, La Grange, Ill.

**AIR
PLUS****JAEGER COMPRESSOR**

Sizes 60 to 500 feet



Your turn is coming when Jaeger will supply you with the smoothest running 2-stage, air-cooled compressors you've ever operated . . . Built to aircraft engine precision standards in a balanced "W" design, with "Tough Swedish Twin" Valves for air plus coolness, full force-feed lubrication and large reserves of power, they are efficient in performance, accessible and long-lived in every part . . . Please be patient until Uncle Sam's needs have been supplied . . . THE JAEGER MACHINE COMPANY, Columbus 16, Ohio.

JAEGER*Engineered* **EQUIPMENT****"FLEET-FOOT"**
Crane-Loaders**"SPEEDLINE"**
Concrete Mixers**"SURE PRIME"**
Contractors Pumps

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS

ROADS AND STREETS, July, 1944

LOOK AHEAD! ACT NOW!

**Next Winter's
Snow Removal Equipment
Must be Ordered NOW!**

Snow storms won't wait for equipment that's late! Check your snow removal equipment now—while there is still adequate time to plan your needs, to make comparisons of various equipment and insure delivery when needed.

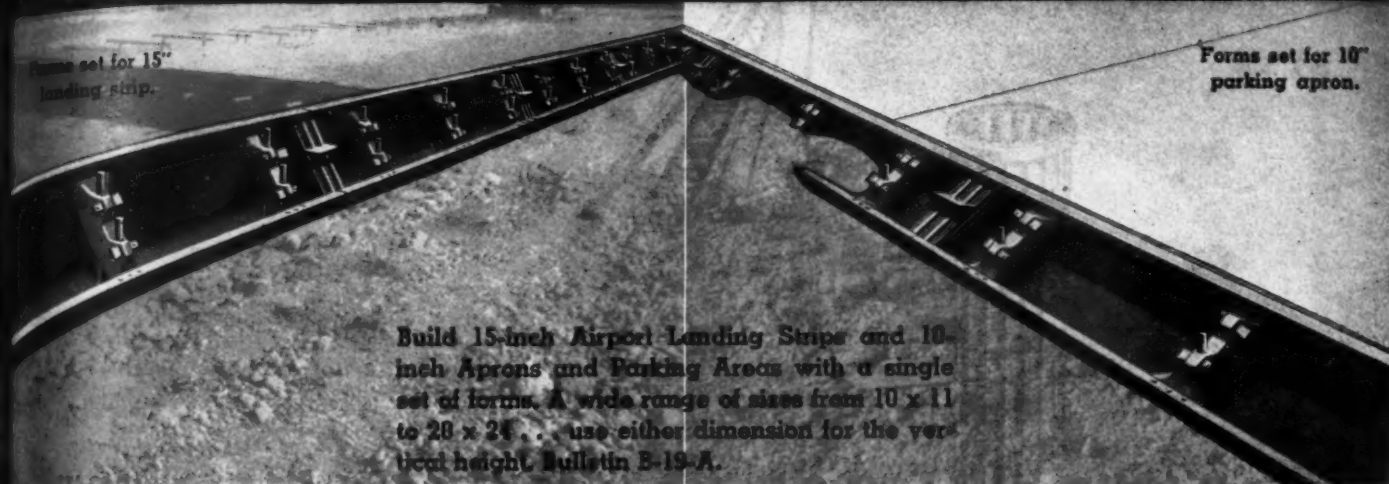
Take the first step today! Write for information on powerful and effective Walter Snow Fighters; the only units that provide a Four Point Positive Drive system to give greater traction, power and speed. Models to meet all snow conditions, including the new 250 H.P. Super Snow Fighter to open a 28 foot width in one run—smash through road-blocking drifts—clear more miles per hour. Walter Snow Fighters are carefully engineered, highly specialized equipment that can not be hastily manufactured nor delivered on short notice. Plan now—order early—and be ready for the first snow next winter.

WALTER MOTOR TRUCK COMPANY
1001-19 Irving Ave., Ridgewood 27, Queens, L.I., N.Y.

Deliveries are now being made on Walter Four Point Positive Drive Tractor Trucks and Snow Fighters for essential civilian needs. The War Production Board has authorized the production of various models, in addition to the military requirements.

**WALTER
SNOW FIGHTERS**

THREE WAYS HELTZEL Can Help You With Post War Concrete Construction



Forms set for 15" landing strip.

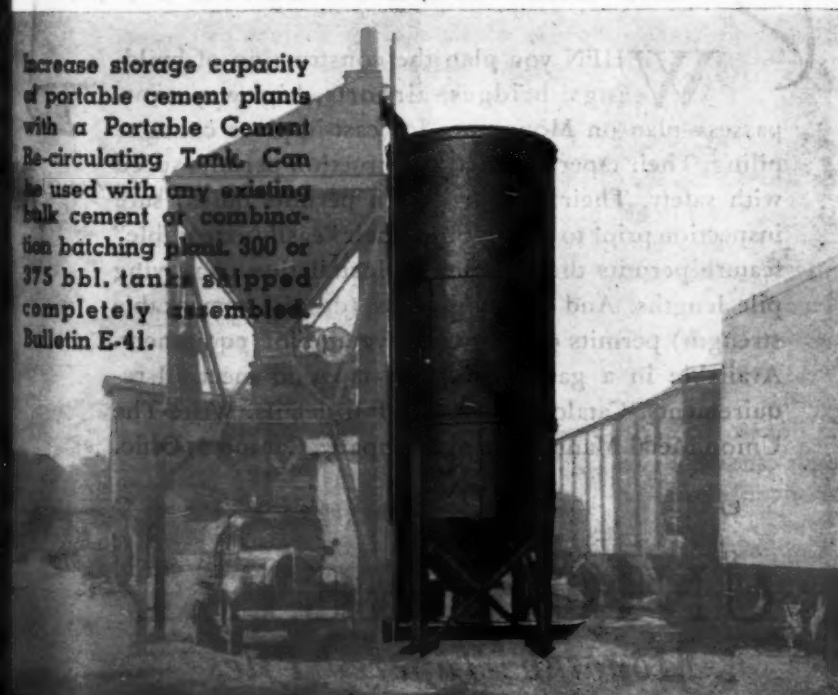
Forms set for 10" parking apron.

Build 15-inch Airport Landing Strips and 10-inch Aprons and Parking Areas with a single set of forms. A wide range of sizes from 10 x 11 to 20 x 24 . . . use either dimension for the vertical height. Bulletin B-19-A.



Change your batching plant from batch-truck to truck-mixer operations with the Heltzel Universal Batcher . . . and a handful of bolts. Interchangeable gate sections are the same weight. No need to re-set scale equipment. Furnished as standard equipment on new plants . . . can be installed on any Heltzel Plant now in service. Dial to Beam type scales. Bulletin C-34.

Increase storage capacity of portable cement plants with a Portable Cement Re-circulating Tank. Can be used with any existing bulk cement or combination batching plant. 300 or 375 bbl. tanks shipped completely assembled. Bulletin E-41.



Other Heltzel Concrete Construction Equipment for Greater Production . . . Lower Costs.

Truck Mixer Charging Plants . . .
Central Mixing Plants . . . Portable,
Semi-Portable or Stationary Bulk
Cement Batching Plants or Tanks . . .
Steel Storage Bins . . . Concrete
Buckets . . . Steel Road Forms . . .
Steel Street Forms . . . Portable
Batching Bins . . . Joint Installing
Machines and Materials.

HELTZEL Steel Form & Iron Co., Warren, Ohio



Monotubes

—the First Word in Foundations
—the Last Word in Speed

WHEN you plan the construction of buildings, bridges, airports, highway overpasses—plan on Monotubes for cast-in-place concrete piling. Their tapered, fluted construction permits speed with safety. Their tubular design permits quick, sure inspection prior to concreting. Their "easily extendible" feature permits the economical installation of varying pile lengths. And their lightness (despite remarkable strength) permits driving with average job equipment. Available in a gauge, size, and taper to meet all requirements. Catalog 68A gives full details. Write The Union Metal Manufacturing Company, Canton 5, Ohio.



UNION METAL
Monotube Tapered Piles

You Can Do More Profitable Black Top Paving Jobs

**With an
ADNUN**

- Lays any mix—hot or cold.
- Lays any thickness.
- Lays any width.
- Reduces waste of materials.
- Will lay pavement to any specification of crown or bank.
- Power to handle the heaviest truck.
- Four-wheel drive—no slipping.
- One man operation.

Fast placing of heavy crushed rock or slag to meet standardized specifications in one or two courses up to a depth of 6" is one of the most successful extra uses of this versatile paver. Adnun features insure compaction and a tight joint at the curb or with parallel courses due to the action of the overlapping Cutter Bar, save time and labor by eliminating forms.

On rush jobs, two Adnuns can be teamed up, one to lay the rock and the other the binder mix and wearing courses. An Adnun can be quickly changed in the field to handle either black top or crushed rock.

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER



Above: For accurate spreading of stone or slag there is nothing to equal the Adnun. Here an Adnun is laying slag for airport runways.

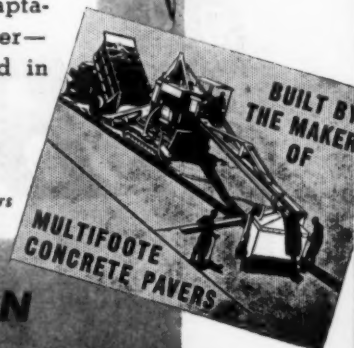
Below: Adnun laying smooth top surface on airport without need for excessive sub-grade preparation. Note smooth finished surface and tight joint between strips.



No other machine has proved so adaptable to such a wide range of materials used in construction. No other paver has Continuous Course Correction, power Cut-Off hydraulically controlled as a unit, Variable-Speed Cutter Bar, and Hydraulic Controls to insure fatigueless operation. No other machine will handle crushed rock, slag, soil cement and all types of asphalt mixes with the adaptability of the Adnun Black Top Paver—first in the field and still far ahead in performance.

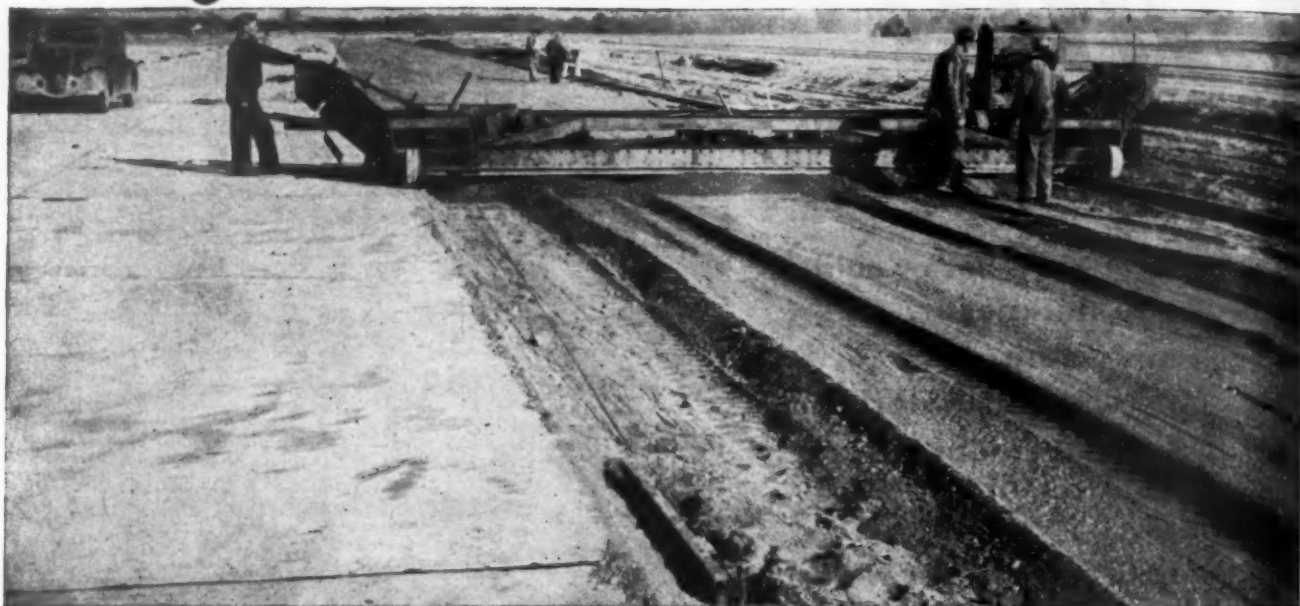
THE FOOTE CO., INC.
NUNDA, N. Y.

*The World's Largest Exclusive Manufacturers
of Concrete and Black Top Pavers*

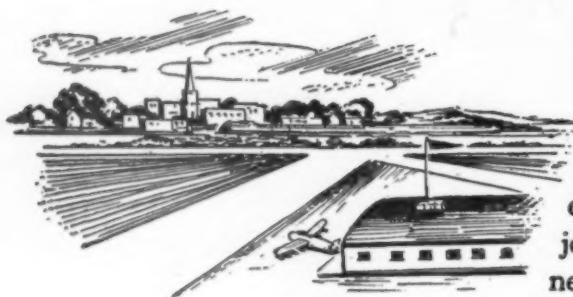


WITH CONTINUOUS COURSE CORRECTION

when *Corntassel Corners* builds an Airport...



... will you *DO THE PAVING?*



You can get the contract if you have the equipment for doing a better job for less money in a shorter time. Buckeye R-B Power Finegraders for preparing subgrade offer you big advantages on any paving job. They save labor by doing away with nearly all hand labor on the grade. By keeping the prepared grade always well ahead of the pavers they eliminate expensive delays. Less material is required because accurate subgrade reduces loss of yield to a negligible percentage. All types of soil, including sticky gumbo and rock-laden materials are readily handled. Write for full details today. Get ready for tomorrow's big paving jobs now!

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO



Buckeye

Tractor Equipment
Road Wideners

Power Finegraders
Trenchers

Convertible Shovels
Spreaders



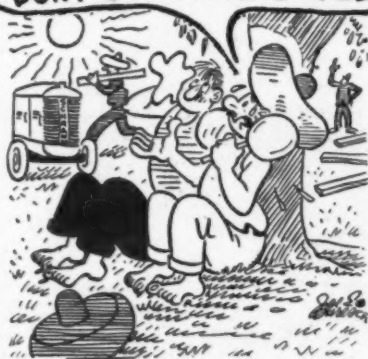
When your construction job calls for...

A TOUGH AIR COMPRESSOR



.....SCHRAMM FITS THE BILL!

LOOK CARLOS—MIRACLES NEVER STOP—WE SIT IN SHADE AND ARE OVERHEATED—YET THE SCHRAMM COMPRESSOR WORKS WITH SLIDE DOORS CLOSED AND DON'T GET OVERHEATED!



So you've another tough construction job that calls for an air compressor *able to stand anything?*

This ruggedness you specify—it's a big feature in Schramm Air Compressors. Note, for instance, in the above action picture how easily Schramm is doing the compressed air job—and giving all the air needed.

And—during these hot summer months—the fact that Schramm Compressors are completely watercooled to give service equal to winter weather months, means an advantage worth noting.

Schramms are lightweight—compact—sturdy units. If you are not already using a Schramm Air Compressor, it will pay you to write at once for illustrated Bulletin EC-44.

SCHRAMM


THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

M-1 vs. Muck

● Rugged men driving rugged trucks for Uncle Sam plough ahead into jungles and forests, through rivers and over trails that would make even a pack animal think twice. Naturally, a truck crew can expect to have to yell for help every so often.

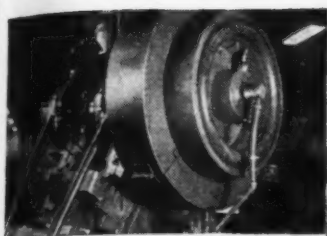
That's where the M-1 Heavy Wreckers (which we turn out by the hundred under the supervision of the Rochester Ordnance District) come in handy. They have the power, the equipment, and the traction it takes to get other vehicles out of trouble.

With the exception of a restricted amount of much-needed civilian fire apparatus, our Ward LaFrance Truck Division factories are making nothing but military vehicles today. However, authorization has been received to manufacture a limited number of commercial trucks for civilian use during the latter part of this year. They will embody typical Ward LaFrance automotive engineering skill, and incorporate improvements born of this war. Why not write our Sales Department now.

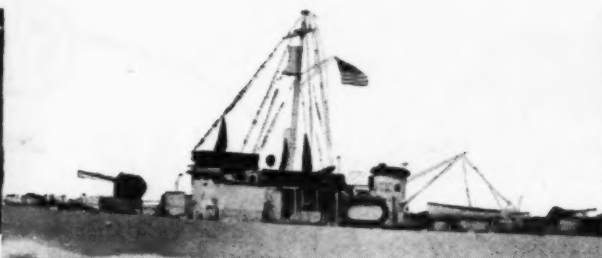
★ **WARD LAFRANCE** ★
TRUCK DIVISION
GREAT AMERICAN INDUSTRIES, INC.
Elmira,  New York



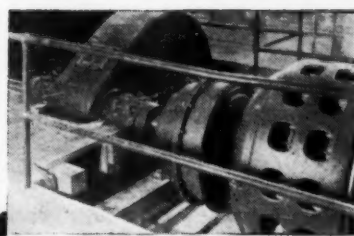
WARD LAFRANCE



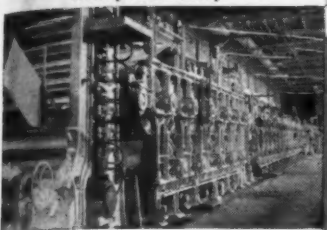
Heavy Machinery



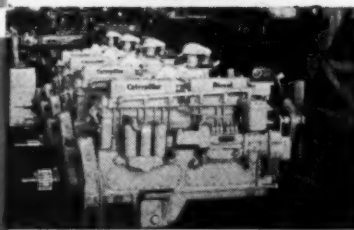
Destroyers — Tugs — Landing Craft



Rubber Mills



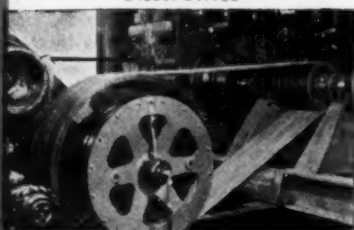
Paper Machines



Diesel Drives



Drops and Cranes



Oil Field Machinery



Mine Hoists



Steel Mills



The CLUTCH with a WAR RECORD

Wherever the going is *tough*—where heavy-duty drives *must* deliver unquestioned performance—the Fawick Airflex Clutch is making records.

On thousands of Diesel-driven Naval vessels, and throughout the entire range of war industry, this Clutch is absorbing shocks and vibration, without springs, levers, arms or toggles. No moving parts—no adjustments to make—no lubrication required—low maintenance costs. Power and torque are completely controlled by air pressure.

If you require Clutch, Brake, Slip-clutch or Flexible Coupling, with guaranteed performance, write us. Our engineering department will gladly give you details, and help you work out applications for *your* machines.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. Cleveland 11, Ohio

In Canada, Renold-Coventry Ltd., 1006 Mountain St.,
Montreal, Canada

In Britain, Crofts Engineers, Ltd., Bradford, England

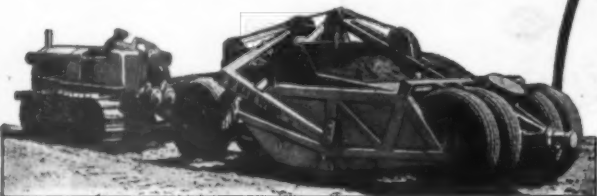
FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

ROADS AND STREETS, July, 1944



2A 4-wheel hydraulically operated Scrapers for earth moving, specifically constructed for fast digging, easy loading, accurate spreading.



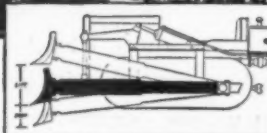
2B 4-wheel cable operated Scrapers for earth moving provide less power to load; greater clearance; flexibility for fast hauls; positive rolling ejection; precision spreading.



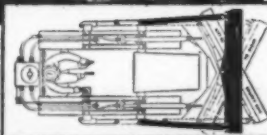
2C 2-wheel hydraulic Scrapers for low-cost, earth moving—dig, load, haul, back dump, make short turns.



2D Bulldozer: Blade fixed for pushing loads ahead.



2E Roadbuilders: Blade set to push loads ahead, side-cast loads to left or right.



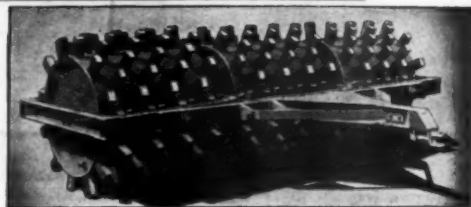
GAR WOOD Road Machinery

Gar Wood Industries, Inc., manufactures a complete line of heavy-duty, earth-moving machinery: two-wheel Hydraulic Scrapers in 3, 5, 6, and 8 cubic-yard capacities; four-wheel Hydraulic Scrapers in 8, 10, and 15 cubic-yard capacities; four-wheel Cable Scrapers in 11, 15, 20, and 25 cubic-yard capacities; Bulldozers; Roadbuilders; Tamping Rollers; Rippers. Accepted by leading contractors and governmental agencies throughout the world, as meeting all requirements for heavy earth-moving equipment.

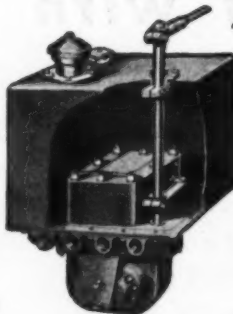
Refer to picture number when ordering literature



2F Rippers rip compacted earth, shale, rock, roots, old pavements, old roads.



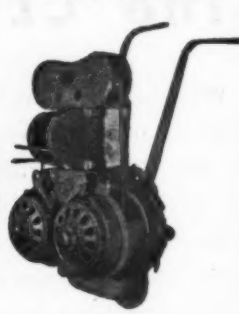
2G Sheep-foot Tamping Rollers built with interchangeable drums (single, double, triple).



2H Hydraulic Control Unit



2J Cable Control Single Drum



2K Cable Control Double Drum

Hydraulic and Cable Control Units for operation of Scrapers, Bulldozers, Roadbuilders, Rippers, for heavy-duty service with track-type tractors.



GW ROAD MACHINERY
is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION

GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN



GEMMER STEERING GEARS

Simple Design—extreme sturdiness—use of anti-friction bearings at all critical points—make adjustments and servicing almost non-existent in Gemmer Steering Gears.

The life of the Gear is the life of the vehicle—steering is easy—remains easy.

Additional outstanding features of Gemmer Steering are:

Gear Teeth That Roll—No sliding contacts between gear teeth. The hourglass worm bears on teeth that roll, providing highest efficiency—smooth easy transfer of power.

Stability—Inherent design banishes "lost motion" and reduces wear to the least possible minimum. Steering is always firm, responsive, positive, with absence of rubbery feeling or wander.

Gemmer Steering has demonstrated its worth in all types of peacetime and wartime automotive vehicles from lightest passenger cars to heaviest buses, trucks, roadbuilding machinery, agricultural tractors—is doing an equally satisfactory job on a wide variety of vehicles and small boats for our armed forces.

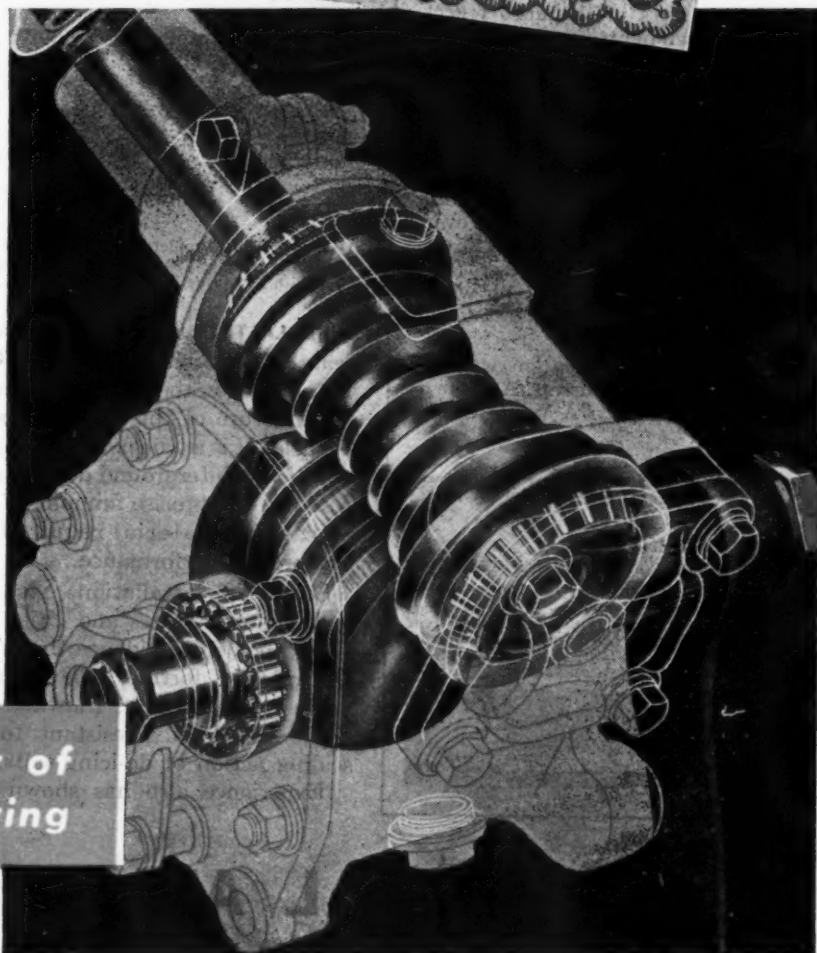
GEMMER MANUFACTURING COMPANY

6400 MT. ELLIOTT AVE.
DETROIT 11, MICH.

**GEMMER . . . Pioneer of
High Efficiency Steering**

Adjustment
AND
Servicing

**ALMOST
NON-EXISTENT**





CONCRETE HIGHWAY NEWS

Universal Atlas Cement Company (United States Steel Corporation Subsidiary)
Chrysler Building, New York 17, N. Y.



OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco

POST-WAR HIGHWAYS CAN BE MADE HIGHLY SCALE-RESISTANT

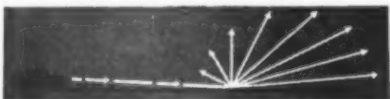
REFLECTING CURB MAKES NIGHT DRIVING SAFER

Highways in a dozen different states protected by Concrete Reflecting Curb made with Atlas White cement

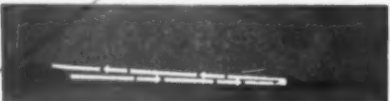
Combining the functions of a reflector with the functions of a curb, Concrete Reflecting Curb made with Atlas White cement has demonstrated its contribution to safer highways in scores of installations in a dozen different states.

The diagrams below show how the sawtooth faces of this curb reflect the car's own lights in the right direction—back to the driver's eyes. This makes the curb stand out clearly and sharply. A smooth curb, even though white, reflects light away from the driver, and therefore is barely visible. When rainy nights turn road and curb into watery mirrors, this reflective advantage is made even greater. Smooth curb is practically invisible, but White Concrete Reflecting Curb shines out as a white guide to safety clearly marking the road's edge.

For detailed information, write to our Atlas White Bureau. Ask for a copy of the book, "A White Guide to Safety."



A smooth curb (above) wastes light... reflects it up and away from the driver. A White Concrete Reflecting Curb (below) conserves light... reflects it back to the driver. A smooth curb is barely visible at night; a White Reflecting Curb stands out—bright and clear.



RS-DC-3

with ATLAS DURAPLASTIC* air-entraining portland cement

More than 60 installations—some with five years of service—in a dozen different states prove value of Universal Atlas development



Lawrence Street, Appleton, Wisconsin, photographed after three winters of salt de-icing treatment. Left lane, laid with normal portland cement, shows considerable scaling. Right lane, laid at same time with Atlas Duraplastic, is practically scale-free.

DURAPLASTIC was announced after years of research and tests by Universal Atlas in the laboratory, in the manufacture of this cement and in the field. It is a true portland cement in which is interground during manufacture the precise amount of air-entraining material required for proper field performance.

Scores of installations made in over a dozen states and cities provide conclusive evidence that Atlas Duraplastic fortifies the concrete against freezing and thawing, and renders it highly resistant to the scaling action of de-icing salts.

Experience also has shown that

(1) Duraplastic requires less mixing water for a given slump; (2) makes concrete more workable, more plastic, more cohesive, more uniform, and more durable; (3) minimizes segregation and bleeding; (4) tends to reduce manipulation scale; and (5) produces concrete that dumps, spreads, screeds and finishes more easily.

When planning your post-war streets and highways, write to our Technical Service Bureau for further information on Atlas Duraplastic. Ask for reprints of technical articles on street and highway installations and on the original research.

*Trademark registered, U. A. C. Co.; all rights reserved.

UNIVERSAL ATLAS CEMENTS

UNIVERSAL PORTLAND • ATLAS PORTLAND • ATLAS WHITE • ATLAS DURAPLASTIC • ATLAS HIGH-EARLY
ROADS AND STREETS, July, 1944



ENGINEERED

TO THE TREMENDOUS JOB AHEAD


With more than \$7,000,000,000 worth of new roads already anticipated as a part of the Nation's road building program immediately after the war, not including maintenance, road machinery will face the biggest test of its career. Standards of performance accepted in the past will not serve the postwar era. These standards must be re-established on a much higher plane of speed, power and dependability.

To meet this challenge HUBER'S Engineers have mustered all of the knowledge, experience and skill at their command. They have cast off tradition-bound practices and "set their sights" on the new future. The results have been amazing.

Today HUBER is "all set" to help the Na-

tion's Road Builders "lick" the tremendous job that lies ahead. It has designed and developed the finest and most complete line of ROAD MACHINERY ever offered to the trade by a single company, with each piece of machinery, rollers, maintainer, bulldozer, sweeper, mower and snow plow, incorporating many new and desirable features. A number of these new features are exclusive to HUBER.

Huber invites distributors to write for interesting facts about its new sales policy and franchise.



Chief Engineer



3 WHEEL ROLLERS • TANDUM ROLLERS
MAINTAINERS • BULLDOZERS
SPEED-SCOOPS • SWEEPERS
HIGHWAY MOWERS • SNOW PLOWS

KEEP YOUR SCRAPER IN *Fighting Trim...*

Your 4-wheel scraper is a fighting tool and must be kept at original working efficiency. Maintenance is no longer a question of individual operating costs only—it is an obligation we owe the United Nations, a means to get more material to the far-flung theaters of war through capacity production and conservation of equipment. Help pave the road to victory by following these hints.

1. Follow a regular schedule of lubrication and inspection. Correct troubles before they become serious.
2. Disassemble and clean sheaves periodically to prolong the life of bearings and pins.

3. Check all cable leads to see that ropes are properly aligned to prevent undue rope wear.

4. If a sheave-stand is bent, straighten it before the bad off-lead damages or cuts the cable.

5. Avoid unnecessary cable strain—do not travel with ejector, apron or bowl at extreme height.

6. If cutting edge shows wear, build it up by welding before lip casting becomes damaged.

7. Check all bolts and cotter pins regularly and watch tire inflation.

Bucyrus-Erie scrapers are built to handle the large-scale, high-speed dirt-moving jobs required by wartime production schedules. But even these rugged digging units need vigilant care to give victory performance day after day, job after job. Your International TracTractor distributor will be glad to help you with a practical maintenance program.

P146-C



**BUCYRUS
ERIE**
TRACTOR EQUIPMENT

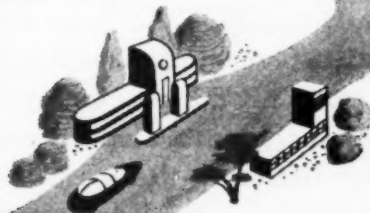
SEE YOUR
INTERNATIONAL TRACTRAC
DISTRIBUTOR

Ready for the Nation's Highways..

Standard Steel's complete line of stationary, unit built and portable batching plants are ready now for production. New and improved features will make this equipment more than ever a leader in its field.

Standard built the first fully auto-

matic electric batching unit. It was the first to have a predetermined accumulative cycle which was interlocked with an auto electric timer. Prospective purchasers of this type of equipment can look for more "firsts" when production is resumed. Right now, our steel fabricating facilities are turning out materials of war. However, we will be glad to give you further information and discuss any specific problems which you may have in preparation for "that time when." Send for bulletins.

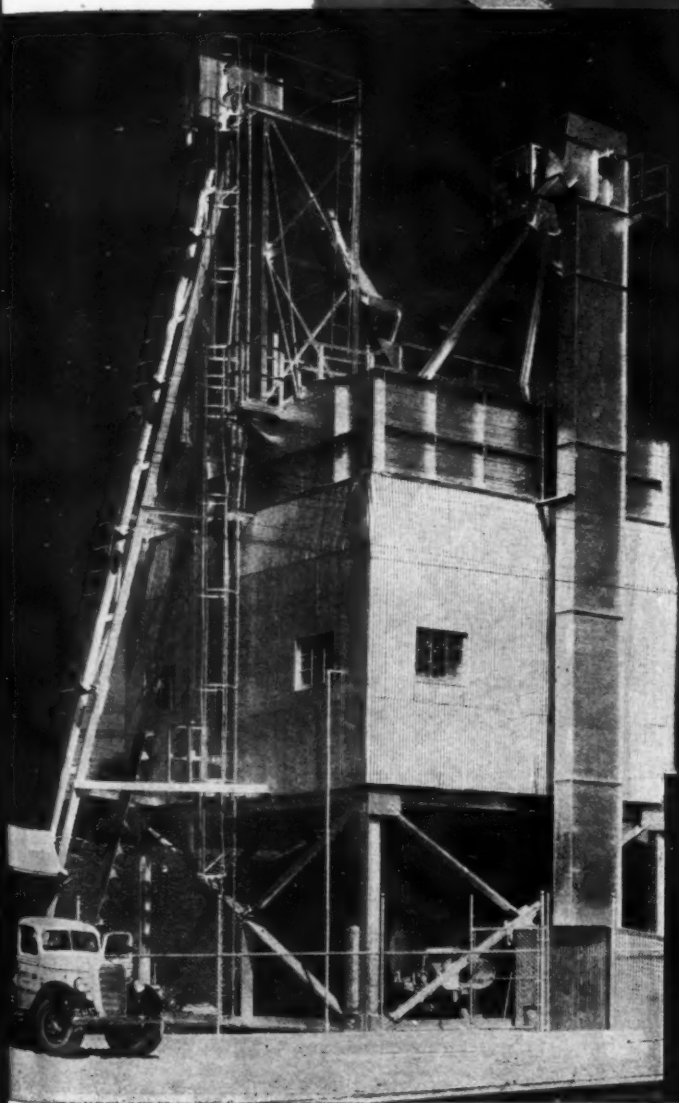


STANDARD STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California

Other Standard Road Construction Equipment:
Rollers, Paving Plants, Dryers, Subgraders, Fin-
ishers, Brooms, Materials Handling Equipment.

ROADS AND STREETS, July, 1944





EUCLIDS ARE

"Made to Order"

FOR TOUGH HAULING JOBS

● Hauling payloads of 15 to 30 tons over difficult off-the-highway hauls is the job for which Rear Dump and Bottom-Dump EUCLIDS are designed and built. Overburden and ore hauling in open pit mines, construction of roads, dams, levees, airports and military installations—these are the types of jobs on which Euclids have proved their efficiency and versatility.

For your present and future hauling equipment requirements, check Euclid job-proved performance for low hauling costs. Your Euclid distributor or representative will be glad to supply helpful facts and figures.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID

SELF-POWERED
HAULING EQUIPMENT

For EARTH · ROCK · COAL · ORE



BALANCED RODS

Another
PLUS FEATURE
IN ALL
WISCONSIN
Air-Cooled
ENGINES



Every connecting rod, in every Wisconsin Air-Cooled Engine, is precision-balanced to eliminate all weight variations in excess of 1/4-ounce per rod.

This is admittedly cutting it pretty fine for a rough-and-ready heavy-duty engine . . . but not too fine for these fine engines. Smooth operation, reduction of vibration to a negligible minimum, prevention of excessive wear . . . these are factors that can be controlled only by the most meticulous care and attention to such small details as this in building an engine.

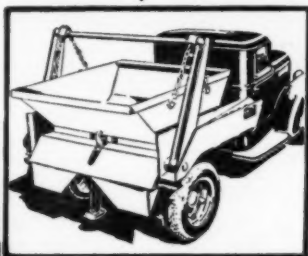
The value of this attention comes into play when a Wisconsin Air-Cooled Engine powers your equipment.

Most per
H.P. pound **WISCONSIN MOTOR**
Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

New Portable Container for Collection of Waste

Showing Enclosed Type Refuse Container that fits on Load Luger in place of regular Dump Bucket.

Write for Bulletin



Brooks LOAD LUGGER equipped with the Enclosed Type Refuse Container (replacing the regular Dump Bucket, as shown above) can be used to advantage by municipalities for collection of garbage and waste in congested sections. Hotels, restaurants and public buildings can accumulate refuse in these sanitary containers for pick-up by Load Luger trucks. Also suitable for disposal of street refuse, as containers can be spotted at convenient points.

507 DAVENPORT ROAD, KNOXVILLE 8, TENN.
Distributors in All Principal Cities

Brooks EQUIPMENT & MFG. CO.
KNOXVILLE, TENNESSEE

Lube Oil Consumption Reduced
More Than 60% With

BRIGGS Oil Clarifiers

IN ADDITION..Operator Reports Engine in
Good Condition After 5 Years Operation



Work like this demands that equipment be kept in top-notch condition for maximum efficiency.

Two Briggs G 800 Oil Clarifiers on this Waukesha Hes-selwood Diesel helped set new standards of economy and performance.

Before Briggs Oil Clarifiers were installed on this Larkin Diesel Shovel that operates 22 hours a day, 7 days a week, a major overhaul was necessary after 9 months operation. Now . . . 4 years elapse between major overhauls; oil is changed every two weeks instead of every week; low-cost Briggs Rem. Fan-ridges are changed weekly; oil consumption has been reduced 66%.

Your Diesel-driven equipment deserves Briggs protection in order that it will give you the maximum in service at minimum operating costs. And YOU . . . from a standpoint of good business . . . owe it to yourself to secure the savings in oil, the savings in operating costs and the increased equipment life that Briggs Oil Clarifiers provide.

There is a Briggs Oil Clarifier for every oil filtration problem . . . for every type and size internal combustion engine. The Briggs distributor nearest you will help you.



BRIGGS CLARIFIER COMPANY
GENERAL OFFICES—WASHINGTON 7, D. C.
Distributors in Principal Cities

ROADS AND STREETS, July, 1944

Longer Life

for the Nation's Highway Network



ADDED LIFE for the country's concrete highways is assured by American Welded Wire Fabric reinforcement. The backbone of cold-drawn, high yield-point steel gives the concrete slab strength to resist shocks and strains in every direction. Even when wartime overloads cause

cracks, the steel fabric prevents them from spreading, avoids spalling and heaving.

Billions of square feet of American Welded Wire Fabric reinforcement have been used in highways and other concrete construction during the past ten years. The steel mesh is easy to

handle, can be installed quickly.

Remember this record of performance when you are planning the highways of the future. Give them the extra life, greater durability they can have only with steel mesh reinforcement. Safeguard them by specifying American Welded Wire Fabric.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York



*Columbia Steel Company, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York*

**AMERICAN
WELDED
WIRE FABRIC**

UNITED STATES STEEL

ACCURATE SLAB FINISH...



Carriage and screed travel along specified crown as controlled by carriage wheels on the template tracks. True contour of the slab is assured by this mechanical method. Slab thickness errors are quickly detected.

DEPEND ON YOUR KOEHRING DISTRIBUTOR
to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.



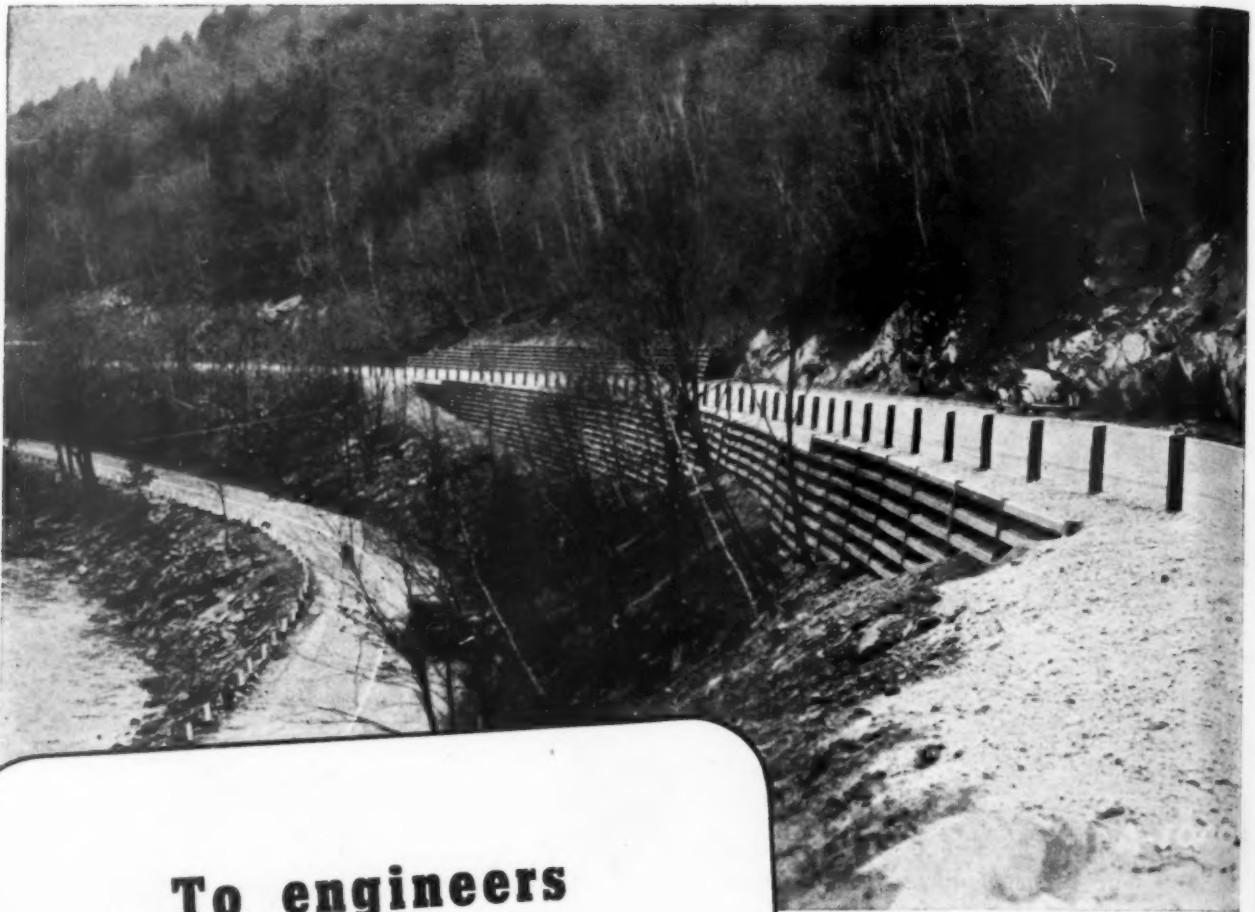
Corrects Surface Errors

With a Koehring Longitudinal Finisher, slab thickness errors are immediately detected, thereby eliminating concrete waste. Crown specifications are followed accurately. Mechanical finishing is positive from beginning to end . . . no variations usually occurring with the manual method. **BE SURE** of surface accuracy with Koehring Finisher. **BE SURE** of the same accurate finish throughout the job, every shift, every day.

KOEHRING COMPANY • Milwaukee 10, Wisconsin



HEAVY-DUTY CONSTRUCTION EQUIPMENT



**To engineers
who are planning the
"BATTLE OF PEACE"**

America will need your plans. Millions of fighting men and other millions of war workers must some day turn to new jobs in a new and different world. You can help by planning now to avert a serious let-down when Victory is won.

No doubt you are thinking about many projects that would not only

improve roads and streets, but even more important would provide jobs for returning service men and workers now in war industries. Even now industry is planning post-war developments to absorb its share of these people. If federal, state and municipal governments have their plans ready, unemployment will

A divided four-lane highway replaces this once narrow state route. Rugged ARMCO Bin-Type Walls stabilize the right-of-way, which is so steep in places that the two pairs of lanes are separated by elevations ranging to almost seventy feet.

★ ★ ★

be less of a problem to America.

In this "board work" you may need a practical solution for unstable slopes, rights-of-way and similar problems. Remember ARMCO Bin-Type Walls for their ability to overcome unequal settlement without cracking or bulging.

So include ARMCO Walls in your plans for the future even though you can't get them for immediate construction. Right now tanks, guns and ships are most important. Armco Drainage Products Association, 365 Curtis St., Middletown, O.

ARMCO



Bin-Type RETAINING WALLS

**MOVED THREE TIMES
TRAVELED 750 MILES in 8 months
PRODUCED 149,121 TONS**



**... WE STARTED OPERATING
IN MARCH AT BISHOP, CALIF.**

"At Bishop, we ran 52,480 tons, after which we moved the plant to Wells, Nevada where we ran 20,033 tons. We used it next at Ely, Nevada where we ran 48,019 tons and then moved it to Austin, Nevada where we ran 28,589 tons making a total of 149,121 tons. We finished on November 6th and would have run about 40,000 tons more had it not been for the early storms...."

Reported by ISBELL CONSTRUCTION CO.

... with a Madsen Plant

A BUSINESS TRIP with an asphalt plant can be a faster, more profitable trip when the plant is a Madsen.

Madsen Plants are easier to dismantle and move because they're built in three portable units—require a minimum dismantling. Easier to erect because they're equipped with the Madsen-patented Jack-Erection System—no cranes, skids or extra devices are required to set up a Madsen Plant.

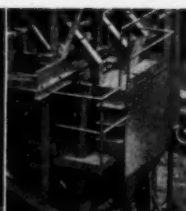
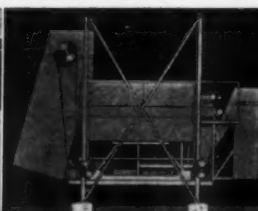
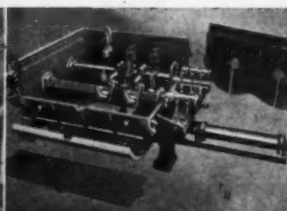
Faster batch mixing because they're equipped with Asphalt Pressure Injection—asphalt is sprayed into the tum-

bling aggregates in the mixer. Aggregates and oil are more thoroughly incorporated in a shorter mixing time. You get greater production because this time-saving means 25 to 40 more batches in an 8-hour day.

Write for new catalog; learn about the many Madsen exclusive features. Unit-Power Transmission; the extra fast mixing cycle; the sectional mixer, and many others. Crane-erection as well as jack-erection plants are available.

MADSEN IRON WORKS
HUNTINGTON PARK, CALIFORNIA

4 EXCLUSIVE MADSEN FEATURES



WRITE FOR CATALOG!



Are you giving any thought to the cranes, shovels and draglines you will be needing for the big jobs being planned for the future.

It is none too soon to start taking stock of your excavator and material handling requirements. Only those with modern and efficient equipment can compete for the tremendous amount of work that must be done after Victory.

There is a LIMA designed and built for the job to be done, whether it be highway construction, metal and coal mining, sand, gravel and quarry work, levee work or any other kind of material handling projects.



LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division - LIMA, OHIO

NEW YORK, N. Y. PHILADELPHIA, PA. NEWARK, N. J. MEMPHIS, TENN. ST. LOUIS, MO.
DALLAS, TEXAS. PORTLAND, ORE. MINNEAPOLIS, MINN.
SEATTLE, WASH. SAN FRANCISCO, CALIF. LOS ANGELES, CALIF. SPOKANE, WASH.
MONTREAL, Quebec, Can. WASHINGTON, D. C.

LIMA

SHOVELS, $\frac{3}{4}$ YD. TO $3\frac{1}{2}$ YD.

DRAGLINES, VARIABLE

CRANES, 13 TONS TO 65 TONS

100% MORE PAYLOAD

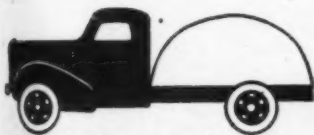
ON YOUR OWN (or a new) 1½-2 ton MEDIUM TRUCK



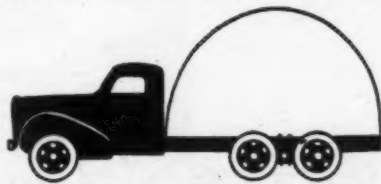
FLASH: Effective July 1st, no priority or release of any kind is necessary for sale of Thornton Drive.

IDEAL EQUIPMENT FOR ROAD CONSTRUCTION

As heavy trucks become more and more scarce for hauling sand, gravel, rock, lime, cement, coal, logs, lumber, equipment, etc., you will do well to consider the THORNTON *Four-Rear-Wheel DRIVE*, which converts your used (or new) 1½-2 ton medium truck into a specially engineered six-wheel, heavy duty truck of unusual ability . . . capable of delivering 100% more rim pull, which permits 100% more payload through sand, mud, muck and up steeper grades. Thornton Drives for conversion readily available without priority. Write at once for full particulars.



3-4 TONS PAYLOAD
BEFORE CONVERSION



8-10 TONS PAYLOAD
AFTER CONVERSION

CHECK THESE FEATURES OF A TRUCK CONVERTED by THORNTON *Four-Rear-Wheel DRIVE*

- ✓ Carry 100% more payload
- ✓ Get 100% more tractive effort or rim-pull than the standard truck
- ✓ A Thornton engineered job out-pulls, out-lasts, out-maneuvers standard trucks costing double or more
- ✓ Two-speed gear case increases tractive effort or rim-pull more than 100% over the standard truck
- ✓ Save as high as 40% on the investment
- ✓ Save up to 30% on operating costs
- ✓ Save as much as 35% on upkeep expense
- ✓ Better springing and load flotation
- ✓ Six wheel brakes assure greater driving safety
- ✓ Save on tires . . . gasoline . . . oil . . . wages and time

**SEND TODAY
FOR CATALOG
and FULL DETAILS**

THORNTON TANDEM CO.

8773 GRINNELL AVENUE • PLAZA 9700
DETROIT 13, MICHIGAN, U. S. A.

Investigate THORNTON Automatic-Locking
DIFFERENTIAL for Replacement in Truck Axles

In Canada see: H. V. WELLES, LTD., Windsor

Thornton Tandem Co.
8773 Grinnell Avenue
Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name

Address

City State

Make of Truck Year

Used for

ROADS AND STREETS, July, 1944

YOUR LINK-BELT SPEEDER HAS GONE TO WAR— ON FRONTS ALL OVER THE WORLD!



Link-Belt Speeder Zephyrcrane
operating in plate shop area.



These steel gratings are used
for tanker runways and catwalks.



Link-Belt Speeder loading mate-
rial on tanker at outfitting docks.

LINK-BELT SPEEDERS ON
IN MARINSHIP CORP. YARDS AT SAUSALITO, CALIFORNIA

HEAVY-DUTY WORK

Buy
More
Bonds and
Hold Them
Until
Maturity!

LINK-BELT SPEEDER



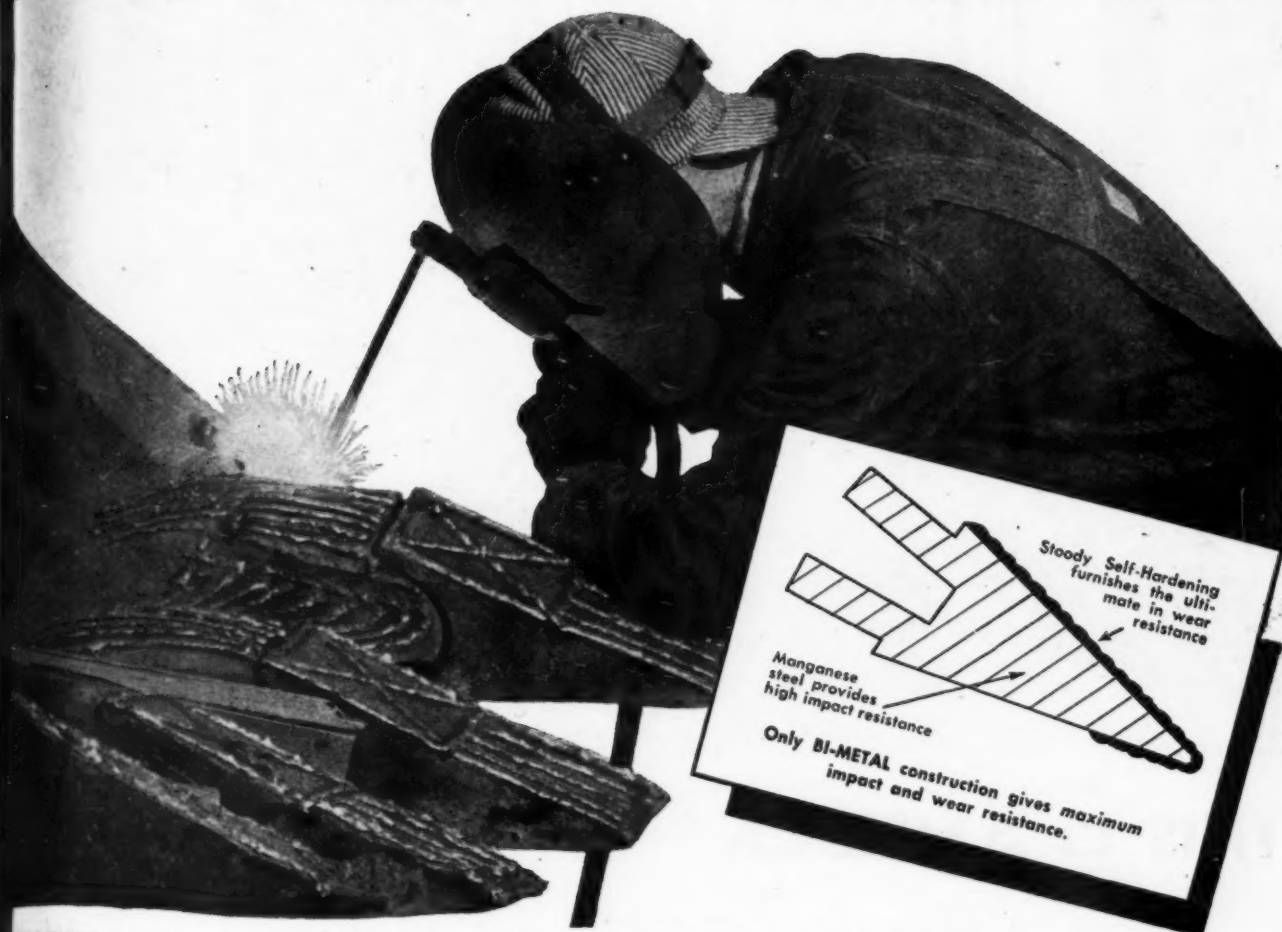
Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES



LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

BI-METAL CONSTRUCTION

Means Longer Life on Shovel Parts



NO SINGLE METAL has both maximum hardness to resist wear and maximum ductility to withstand impact. Either can be obtained only at the expense of the other and generally, where both impact and wear resistance are required, a compromise between the two must be accepted. This is true of the manganese steel employed for bucket lips, runners, etc.

Stoody Self-Hardening over those areas receiving greatest abrasion offers the ultimate in both impact and wear resistance by providing BI-METAL CONSTRUCTION. The manganese parent stock provides high impact resistance. Stoody Self-Hardening furnishes extreme wear resistance—considerably greater than obtainable with either manganese or high carbon electrodes.

Stoody Self-Hardening is a natural for use on shovel parts—it is easy to apply and forms a strong bond with

manganese steel. Stoody Self-Hardening is not only extremely wear resistant, but will not chip even under severe impact. To equalize wear over an entire bucket surface, it is necessary only to hardface those areas receiving greatest abrasion. By controlling spot wear alone, you lengthen shovel life many times and save down time for routine repairs.

Stoody Self-Hardening is available in both bare and coated rods for D.C. electric application and can be purchased from 600 U. S. distributors. $\frac{3}{8}$ " and $\frac{1}{4}$ " diameter rods are priced at 50c per lb. f.o.b. Whittier, California, or distributors' warehouses. Try Stoody Self-Hardening on your next shovel repair and note the increased life from these hard-faced bucket parts.

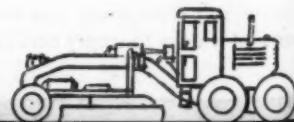
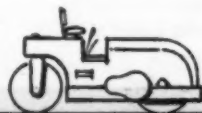
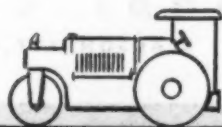
STOODY COMPANY
1125 W. SLAUSON AVE., WHITTIER, CALIF.

STOODY HARD-FACING ALLOYS
Retard wear... Save Repair



THIS IS AMERICA

Maybe Texas, maybe Alabama, maybe New Hampshire, maybe Washington, or maybe Ohio. There is no maybe about the country . . . it is America. Where else would you find such a peaceful scene without the devastation of war marring the landscape? A Galion motor grader moves quietly along this peaceful countryside . . . to make a better road for a better tomorrow. The very simplicity of this scene makes one feel proud to be an American . . . certainly it is a splendid tonic in this war-stricken world.



1907

1944

THE GALION IRON WORKS & MFG. CO.

— Main Office and Works: Galion, Ohio

ROADS AND STREETS

July, 1944, Vol. 87, No. 7

Heavy Girders Set Without Crane

Handling heavy 212½ ft. plate girders with an unloading frame and dollies, and dewatering boiling cofferdams by draining into end sumps, were features of \$930,000 Ohio bridge job on U. S. 50, built by De Salvo Construction Co. and the J. and F. Harig Co.

RELOCATION of strategic U. S. 50, an Ohio Highway project, along the Ohio River between Elizabethtown and Cleves last year, to get above frequent high water, necessitated bridging Whitewater River with a continuous through girder structure comprising three lines of 150½-153½-150½-ft. girders carrying two 26-ft. roadways. The contract, undertaken by the above-named Cincinnati contractors late in 1942, also included grading 2.7 miles of new location and placing 22-ft. dual concrete roadway.

H-Beam Pile Tested

One of the most difficult engineering problems anticipated was that of

securing adequate foundation. Steel H-beam piles were tentatively determined upon and three test piles driven and test loaded. As a result of tests, 50-ft. piling of 69-lb. sections were driven. Although this type of pile was selected with the expectation of striking rock, none was encountered either with the test piles or in driving the foundation piles. However, the test indicated that the piles could safely support better than 45 tons per pile.

The test piles and bridge piles were driven in accordance with a modified formula developed by William Rabe of the Ohio department of highways bridge staff. This formula substitutes a special coefficient based on several

factors such as weight of pile, type of hammer and type of subsoil in lieu of the 2 in the familiar formula $P = 2WH$

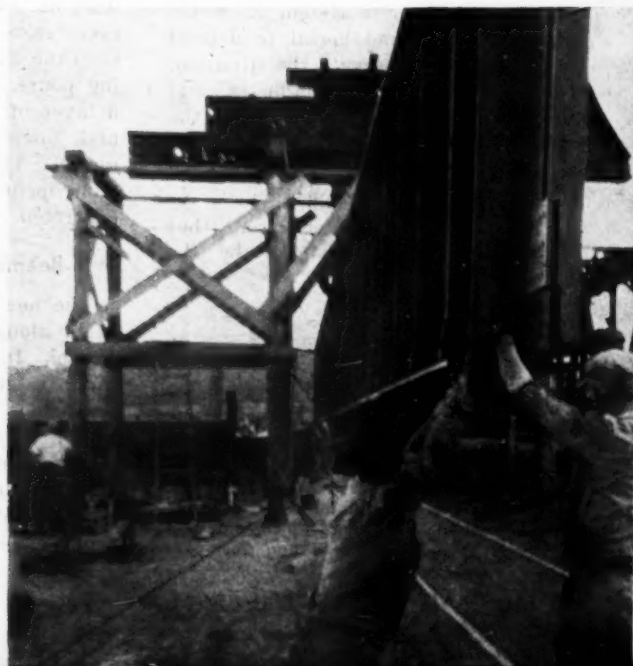
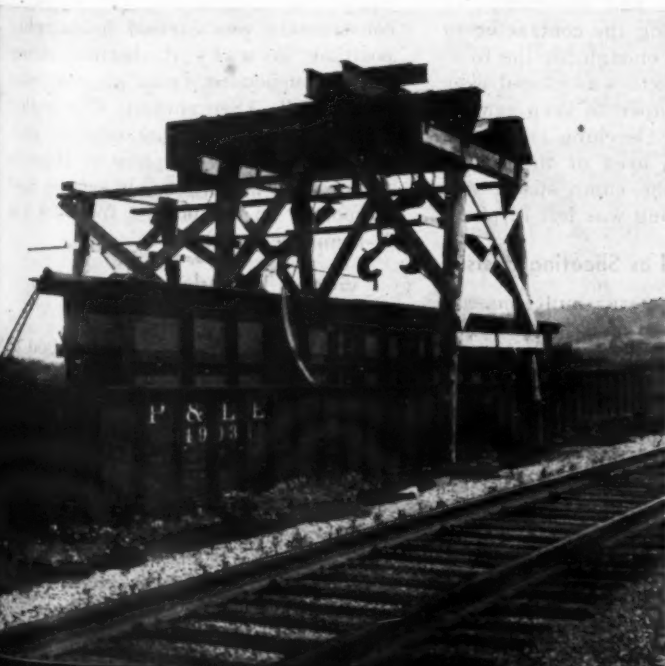
The coefficients developed $S + 0.10$ by Rabe are based on recent extensive studies on pile behavior.

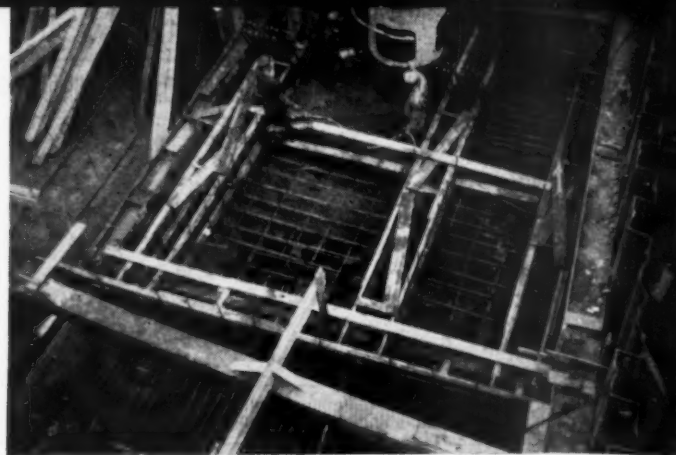
The test load was applied by means of a hydraulic jack, with resistance furnished by a weighted platform consisting of 4 supporting piling with structural steel members framed around them. On this platform were placed a crawler crane and heavy bulldozer (see accompanying photo).

100-ft. Leads Straddled Crane Boom

The contractor built leads for this job out of 100-ft. channels, spaced

(Left): The unloading frame consisted of pile-supported I-beams from which was suspended an 8-rope hoist and grapple hook. The girder section shown is to be field spliced to another short shipment section before being moved into position. (Right): Car has been shunted away and the suspended girder is being lowered to dolly level





Concrete for pier and abutment footings was placed with a 1-yd. drop bucket; in some cases lowered to dumping position as shown, and in others deposited through a long tremie pipe, top of which was held at construction deck level



(Left): Driving a test pile with leads made from 100-ft. lengths of H-girder. (Right): Footings were concreted the full area inside the sheeting, which was left permanently in place. A 6-in. pump aided by smaller pumps was unable to de-water cofferdams until a sump and gravel under-drainage bed were provided. Boiling up was too severe in some cases to permit tremie placement of a concrete seal

wide enough to pass upward on either side of the crane boom. Piles were driven by a 5,000-lb. Vulcan No. 1 single acting hammer.

Cofferdams Gave Constant Trouble

As soon as the steel sheeting had been driven for the east pier, boils developed and so much water came up that the well point system on which the contractor had hoped to depend was unable to cope with the situation. A 6-in. pump was brought in, and still enough water flowed over the bottom of the pit to make placement of good quality footing concrete, even by tremie, out of the question.

The solution employed is one that has been used successfully by the

B. & O. Railroad and perhaps elsewhere. It consisted of excavating the entire cofferdam about 12 in. deeper, filling to bottom-of-footing level with coarse gravel, and draining this layer through embedded drain pipes (open joint) into sumps at either end of the cofferdam.

Sumps and under-drainage were used on all piers and abutments, in every case enabling the contractor to keep the pits dry enough for the footing pours. Concrete was placed over a layer of tar paper to keep cement and fines from leeching into the gravel. The full area of the cofferdam, including the sump space, was concreted. Sheeting was left in place.

H-Beams Used as Sheeting Posts

The new bridge was built immediately alongside an existing railroad bridge. In order to maintain maximum waterway, piers were located as extensions to the railroad bridge piers, this circumstance of course determining span lengths. Pier sheeting was driven without difficulty except at the end next to the old piers, where rip-rap made it necessary to

substitute H-piles driven at approximately 1-ft. intervals. Wood sheeting was driven in a tight fit between H's to make this construction watertight.

Pier Concrete Trolled Along Overhead Rail

As a further means of saving labor and getting along with minimum equipment, concrete for the pier shaft construction was carried to dumping position in a 1-yd. bottom-dump bucket suspended from an overhead trolley rail. (See photo.) The trolley rode the bottom flange of this rail, which consisted of a piece of H-beam piling. The weight of this system was supported on the poured footings via H-beams set as columns.

Girders Unloaded Under 6-Pile Hoist Frame

Another feature was the method of unloading and setting the nine girder sections. These sections, 121½ and 212½-ft. long and weighing 60 and 120 tons each were brought by flat cars to an unloading spur. The cars were positioned until a girder was centered under a 6-pile-supported

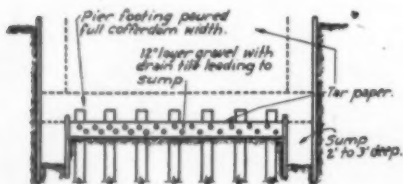


Fig. 1. General details of gravel under-drainage bed and sump which aided in dewatering for the footing pour

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(Left): A 121 $\frac{1}{4}$ -ft. end girder section on two dollies, being moved to the far end of the bridge past other girders already set. (Right): This 203-ft. central girder section has just been moved out on the construction bridge and its weight transferred from dollies to blocks. Note eye-bar bracing and beam supports to hold the girder upright. At left is a parallel girder already in position

overhead frame or scaffold which straddled the track. The girder was cradled to this overhead support by block and tackle which, after shims were knocked out, held the girder suspended until the cars were shunted out from under.

The girders were then lowered to dollies, moved on rails out on the construction bridge, and skidded laterally into position on greased steel plates by means of winch lines leading over and down the far ends of the piers. As shown in Fig. 2, the field splices for the 3-span continuous girder lines are located 29 $\frac{1}{2}$ ft. from the piers. The 212 $\frac{1}{2}$ -ft. center section was slid into place using the permanent piers as skidway supports. But in moving the two side girders, the splice end had to be carried on falsework piles in each instance.

An attempt was made to get along with timber skidways but these developed too much friction and irregularity and greased steel plates were finally required. The details of the entire operation of unloading and setting girders are clearly shown by accompanying illustrations taken by the resident engineer.

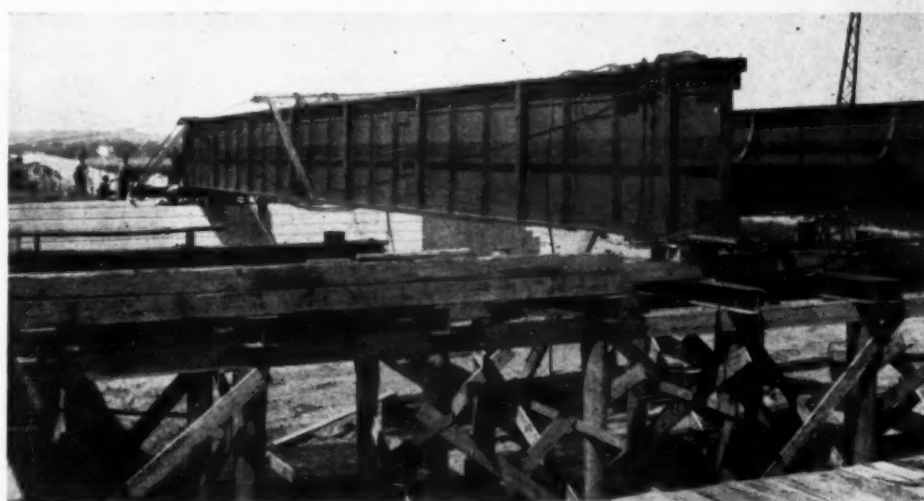
Floor beams, other deck steel and deck slab reinforcing were placed with a crawler crane, which also placed concrete with a 1-yd. drop bucket and handled removal of the construction bridge.

Mall Formed Without Hand Labor by Drag Screed

Russell De Salvo, contractor on the



Fig. 2. Field splices of continuous girders occurred 29 $\frac{1}{2}$ ft. from piers, as shown



approach work moved 575,000 cu. yd. of earth for the 2.7-mile dual roadway, using a 1 $\frac{1}{2}$ -yd. shovel and 13-yd. self-powered rubber-tired wagons. Approach fills having a maximum height of 30 ft. consisted largely of gravel. Gravel sub-base was placed under all pavement. An unusual design detail was the use of special 4x4 ft. sump manholes about 10 ft. deep in the embankments under pavement edges, into which surface water collects and seeps into the granular fill.

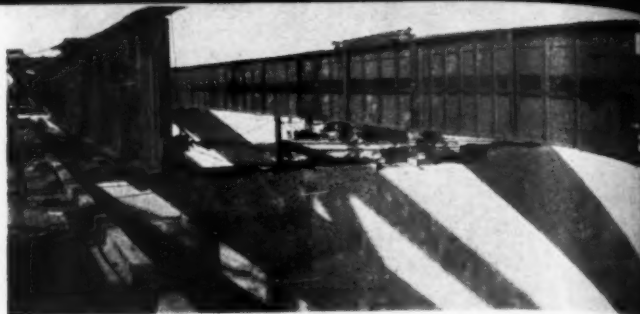
Paving of the white cement concrete mall section between roadways was done in one labor-saving operation by means of a special towing screed, designed by the project engineer. This screed rode the pavement forms or edges and was pulled by a winch. Very little finishing labor was required, and over-manipulation of the concrete, a common tendency in mall construction, was avoided.

The foregoing project was built by De Salvo Construction Co., of Cincinnati, with J. and F. Harig Co., Cincinnati, subcontractors on the structure. It was under the direction

End 121 $\frac{1}{4}$ -ft. girder has been slid laterally into final position by means of winch lines fastened to the support framing. The near end, being a field splice with the central panel (see Fig. 2), rests on falsework. Note pony truss bracing of top chord, provided to stiffen and protect girder during its placement



Details of bracing of end girder section, which has just been skidded into position



Moving central 212½-ft. panel laterally into place. Note blocking and winch line leading down at right

(Left above): At one end, the end panels were carried on falsework until abutment was built. Concrete steel in diagonal position is the reinforcing for counterfort walls of the abutment

(Lower left): Piers were built as continuations of adjacent railway bridge piers. Note how new pier seat envelopes the old structure

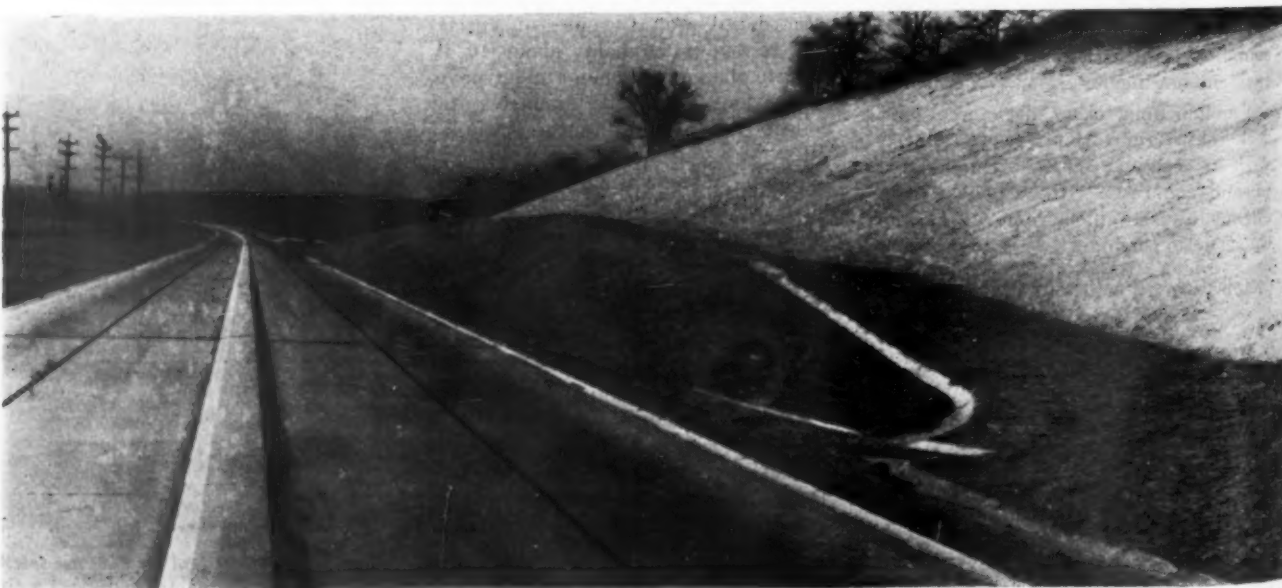
(Below): After setting the three girder lines, a crawler crane handled floor beams, stringers concrete deck materials from construction bridge



(Left): The finished bridge, part of a relocation project required to get a section of strategic U. S. 50 above frequent Ohio river floods



(Below): Deep cuts were landscaped part way up and drainage from upper part of the bank intercepted and carried via open ditch and concrete-lined gutter to culvert as shown. The same culvert also serves a paved side ditch



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(Left): The U. S. 50 relocation was marked by several interesting refinements in design. This jog in the center strip was used where the superwidened outer pavement comes back to normal 2-lane width at the end of a curve. (Right) Troweling white cement curb returns, part of channelization at an intersection near the bridge

relocation
of strategic
floods

of Division 8 of the Ohio department of highways, Middletown, P. S. Bookwalter, division engineer, and Charles Bachmann, asst. division engineer in charge of construction. Stanley McCready was project engineer and R. Orth bridge field engineer. Hal G. Sours is director of highways, W. S. Hindman, chief engineer of bridges and R. O. Nelson, chief engineer of construction.

Congress to Act Promptly on Highway Bill

Congressman J. W. Robinson, Chairman of the House Roads Committee, has announced that H. R. 4915, the post-war highway bill will be taken up promptly by the House of Representatives after Congress' returns from its recess on Aug. 1.

Prompt action on this bill is essential as 45 state legislatures convene Jan. 1, 1945, and they should know in advance of the intent of Congress in relation to future appropriations which must be matched by the states.

In a telegram to Chairman Robinson, Samuel C. Hadden, President American Association of State Highway Officials, pointing out the need for speedy action on the bill, states:

"As you know, it is necessary for Congress to establish post-war Federal-aid highway policy before states, counties, and cities can proceed toward solution of complex legal, financial, and engineering problems which must be met in advance to assure sound post-war road program. All states are deeply concerned and time is running against us. Prompt action by Congress is urgent so that this vital phase of post-war planning will not be too little and too late."

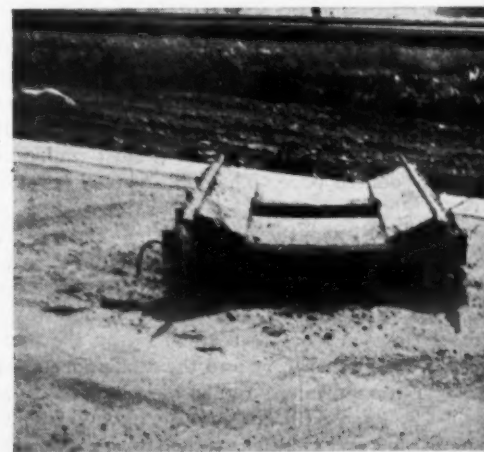


A carpet under the paver! As a protection against defacing the new pavement, pieces of discarded rubber belting were laid in the path of the paver while concreting the center mall

Motor-Fuel Tax Collections—Approximate motor-fuel tax collections in 34 states for the first four months of this year were 23.4 per cent below the collection for the corresponding month of 1941. In 1941 the total net receipts were \$181,682,000; in 1944 they were \$139,182,000.

Teaching of Timber Engineering Increases—A growing recognition of timber as a structural material is revealed in a survey conducted by the Timber Engineering Company, Washington, D. C., which disclosed that 188 engineering and architectural professors in 135 universities are teaching timber engineering. These figures compare to 31 professors in 23 universities shown in a similar survey in 1936.

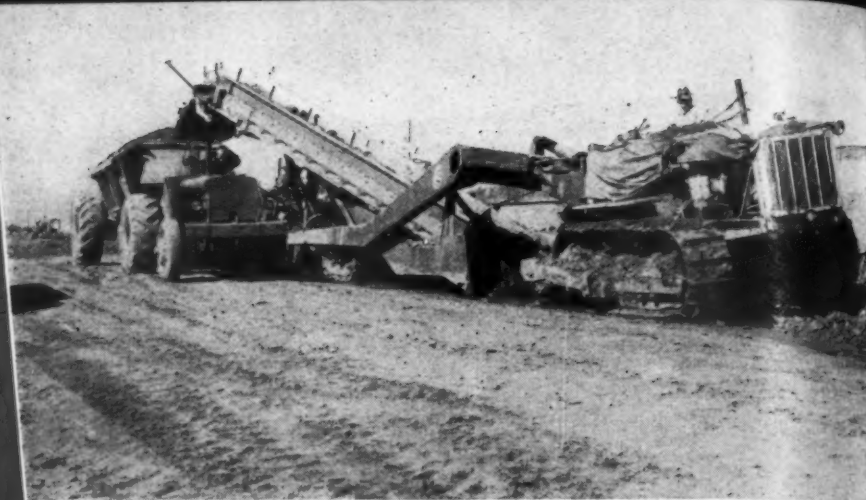
Handy labor-saving drag-form used by De Salvo Construction Co. to build the white cement median strip on dual approach road



384,000

Cu. Yd.

moved in single week
at
Hensley Field



Using 180 pieces of equipment, Kiewit-McDougald-Western combine on one of biggest, fastest airfield jobs in Texas; 1,700,000-cu. yd. lake fill and 1,600,000-cu. yd. stream diversion channel involved. New loader gets work-out

WHEN the three veteran outfits, Kiewit & Sons Co. (Omaha), McDougald Contracting Co. (Atlanta) and Western Construction Corp. (Sioux City) teamed up last October to land the \$1,700,000 grading contract at Hensley Field, near Dallas, they knew they had a job on their hands. Having only from December, when they could get rolling, to June 1 in which to move 4,500,000 cu. yd. of sandy-clay, blue clay and shale, including extensive under-water dumping—come fair weather or foul—they had to set an almost unprecedented pace. The job involved several problems.

First, there was the matter of maintaining a heavy volume of airfield training traffic during replacement of the old white rock runways, which were to be torn up by the paving contractor and the stone spread as a base course under the new runways.

Secondly, the new runway layout necessary to accommodate heavier air-

BY H. J. McKEEVER
Editor, ROADS AND STREETS

craft was such that two of the runways had to be relocated and extended out into adjoining Mountain Creek Lake, one about 2,000 ft. and the other 500 ft. (See Fig. 1). More than 1,700,000 cu. yd. of material was eventually placed below the surface of this artificial lake (dammed-up stream), the filled area having a maximum water depth of 12 ft.

Thirdly, one of the lake extensions resulted in entirely filling an arm of

the lake at the mouth of a sluggish creek, which in turn necessitated excavating a cut-off channel 3500 ft. long and up to 50 ft. deep—a miniature 1,600,000-cu. yd. "Culebra Cut" which proved a real task in itself.

A major portion of the dumped fill material was obtained from this channel, with an average haul of 3,000 ft. More than 2,000,000 cu. yd. additional dumped and rolled fill came from an extensive borrow area located between the field and the new channel. (Again see Fig. 1.) Here high ground was taken down as much as 40 ft., and a 40 to 1 glide angle slope obtained in the process. Overhaul from the cut-off channel and borrow field averaged about 1800 ft.

Dumped Fill, Including Subaqueous

Interest centered primarily around the lake fill, the main problem being to deposit new material without trapping the layer of soft muck which

Scenes at Top of Page

(Upper): A new-type loader had quite a work-out (see article), heaping as high as 900 cu. yds. an hour onto wagons in best going. (Lower left): a motor grader giving pusher service. Grading contractors used all known tricks to coax more output. (Lower right): With 40 to 50-ft. cuts in the canal and borrow area, shovels and draglines up to 2 or 3-yd. proved economical

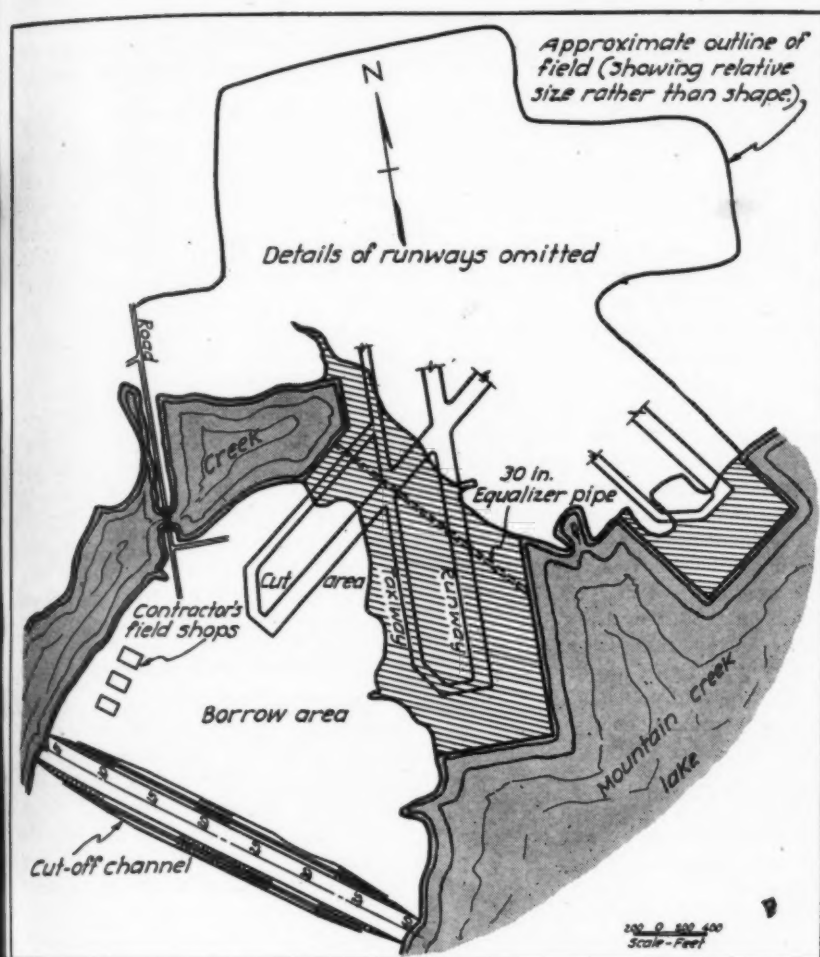


Fig. 1. Showing how two reconstructed runways were extended into a lake at Hensley Field and closed off creek by-passed through a new channel

blanketed the bottom*. Original specifications called for bringing dumped fill to a minimum of 2 ft. above the lake level. However, it was found that satisfactory compaction was being obtained from the extra heavy processing and hauling equipment employed and it was decided as a safety factor, to take care of possible fluctuations in the lake level, to raise the dumped portion of the fill to $3\frac{1}{2}$ to 4 ft., stable height above water before beginning rolled layers.

Filling began on the far shore of the creek channel. Bottom-dump "wheelers" and end-dump wagons were used largely to build toward the near shore, the material varying from sand-clay to shale. The aim was to push back soft muck progressively by displacing it with heavier, relatively dry dumped material. Soundings were taken at frequent intervals to check the success of this operation. The muck actually was so completely shoved ahead that in all the project only one small trapped muck lense, about 6 x 10 ft., was found. This

material was replaced. In fact so compactly was the fill material slid into place that most of it remained in an unsaturated condition for the full depth, as shown by borings taken to the bottom many weeks after placement.

The lake-filled berm in each instance was made about 1300 ft. wide, to provide for a 150 ft. runway with a parallel taxiway located 500 ft. to one side (c.l. to c.l.). As filling progressed along the pavement axis, the dumping line was maintained in a rough inverted U or outside convex shape

The U. S. Engineers had to extend embankment into a lake and relocate a small stream through a hill in order to extend runways at Hensley Field, Texas. More than 1,600,000 cu. yd. of shale, blue clay and other material was moved out of the stream cut-off shown.

Note 20-ft. berm or shelf along the 2 to 1 slope

(Fig. 2), in order to "channel" the replaced bottom muck into the berm area between runway and taxiway. This was done as an extra precaution to make certain that any muck that might get trapped would lie between, rather than under, paved areas.

Filling was carried forward in this manner until the creek channel had narrowed to about 40 or 50 ft., then dumping was done in the middle to form a narrow approach to the near shore. Then by aid of water from nozzle of a fire truck, the muck which had pushed up above the surface of the water was kept lubricated so it could be pushed either way from the narrow approach. By wetting this muck and pushing it with the fill material, and by scraping it from the fill with a large cottonwood log towed by 2 tractors, the gap was closed without trapping any mud under the fill.

In order to prevent stagnation of the closed-off creek arm, a 30-in. diam. corrugated, bituminous-coated drain pipe was installed along the axis of the filled channel (Fig. 1).

Early in the design of the project studies were made as to the amount of settlement that would occur in the lake fill and the degree of stability obtainable. Although the contractor expected to have to place 12 to 18 inches of extra rolled material to take care of subsidence, actually the extra came to only about 4 in. As a means of checking subsequent settlement, the engineers embedded 30-in. square steel subsidence plates in the first 6-in. rolled layer, and took elevations through auger holes periodically after completion of the fill. These readings have shown a satisfactory stability.

Shore Line Difficulties

A "levee," sloping 8 to 1 on the lake side and 5 to 1 on the land side, was built along the lake-filled berm to intercept surface drainage. Run-off is carried through by batteries of 2 or 3 small corrugated iron pipes.

Field drainage, which was part of the paving contract, involved only the



*For similar problem and filling procedure at another airfield, see "Runway Extension Was a Mucking Job," *ROADS AND STREETS*, May, 1944.



The auger is being employed to locate a buried subsidence plate, on which levels are taken periodically to check stability of lake fill

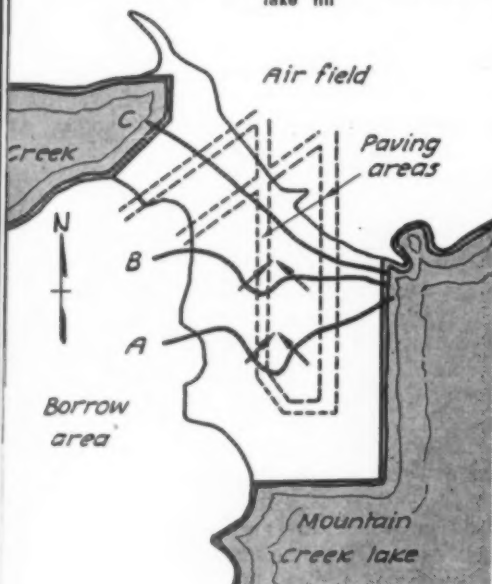


Fig. 2. Lines A, B and C show approximate contours of dumped fill as it progressed. The inverted "U" shape was maintained to "channel" displaced bottom and between rather than under areas to be paved

simplest 30 in. to 48 in. collecting system, including one 48-in. storm line 2700 ft. long.

The original plan called for building fill to a 20 to 1 slope below the water line and 8 to 1 above. After the slope had been completed a short time, however, cracks appeared about 10 ft. back from the water line ("X" in Fig. 4) denoting pulling away and kicking out of toe below water. This action was no doubt accelerated by waves from a prevailing stiff breeze. Additional material was dumped along the shore and pushed out to make a 20 ft. shelf, after which it settled into a "beach" having approximately the contour of the dotted line in Fig. 4.

Notes on Rolled Fill, Special Heavy Sheepfoot Rollers

A 2½-ft. layer of heavy clay was found over the entire working area.

ROADS AND STREETS, July, 1944

Operators made it a point to put this in the dump wherever possible, and keep it out of the rolled layers. Shale encountered in one end of the cut-off channel and in part of the borrow area was used as shoulder ballast and kept out from under paved areas. Small amounts of shale used in the rolled fill were given a 2-ft. blanket of better material.

In order to get the specified compaction—95% modified Proctor under paved areas and 85%-90% in the berm—the contractors had ten dual-drum sheepfoot rollers built by a local manufacturer to a design (5-ft. diam.; 7-in. lugs) which provided 550 lb. pressure per sq. ft. of lug surface. Sixteen other rollers were loaded with iron rust to increase their weight.

So successful was the compaction operation that much of the under-pavement sub-base was compacted to 99% maximum density. Rollers "walked on top" near the finish.

These heavy rollers could not be used in cut sections, however, because the vibration and pressure drew moisture to the surface from the high water table.

Cut-off Channel Excavation

The cut-off channel extends through a rise of ground requiring a max. cut of about 50 ft. The strata encountered consisted of sand-clay, blue clay and shale, the shale sloping upward along the channel axis, from near the bottom at one end to a point near the top at the other.

Practically all the equipment on the job ganged up on this channel except tractor-drawn pans, for which the haul was too long. Shovels went at the shale, and draglines at the clay, loading into end-dumps and "wheelers." All-wheel self-loading scrapers handled a large volume of the top layers, and got along well in lower strata with rooters helping. A new

type heavy-duty elevating loader turned in an excellent performance. Excavation was hauled out around the ends and via a ramp near the middle.

"Pilot" Channel

The sequence of channel cutting is of interest. The first step, carried out as filling of the natural channel progressed, was to cut a pilot channel (see Fig. 3), having a bottom width of about 30 ft. Dams were left at either end and broken through at the time of creek closure. Next, the rest of the channel cross-section was excavated. A berm ("A" in Fig. 3) 10 to 15 ft. wide and extending just above the water line was left to prevent flooding while below-water excavation was completed full width in the dry. As noted, the channel sides were sloped 1 on 2, and a berm was provided 20 ft. above the water line. Slopes were made by dressing shovel cuts with motor graders.

Notes on New Loader

An elevating loader of recent heavy-duty design (Euclid) was given a real workout. It averaged 50 to 60 loaded bottom-dump 13-yd. wagons per hour (struck measure). Peak production attained was said to be slightly over 70 loads per hour; loading time per wagon averaged about 30 to 40 seconds, depending on the material. From 50 to 80 ft. of travel distance was required to load out the hauling units.

The materials worked by this unit consisted of heavy clay, gumbo and shale which was very compacted and quite chunky. In order to obtain high production in a minimum of travel distance, the material was rooted ahead of the loader.

The number of hauling units working with the loader varied from day to day due to changes in the length of haul, but about 15 bottom-dump



The edge of the lake fill was topped with a small dyke to prevent surface washing (see Fig. 4). View looking along a dyke. Corrugated iron drains shown were spaced every 100 feet or so

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Here the contractor has reached an intersection, and is inching his joint-strip machine around on a skid to start paving in a new direction. Tractor is towing one side of the skid forward, grader nudging other side back until the machine is in new position

(Left): Storm drains were backfilled with scrapers, dozers, sheepfoot rollers



This subgrade planer is a "war baby" made in the shop by Texas Bitulithic Co. Blade adjustment wheels and other parts came from here and there



The curing spray man had quite a time reaching across the wide lanes even with this long spray arm, due to high prevailing wind

(Right): Unloading bulk cement was a dusty job, handled efficiently with a small front-lift-equipped wheel tractor, whose motor was encased for dust protection



(Far Right): This "heavy duty" sprinkler really covered the ground. It was made by building a tank onto the chassis of an extra heavy duty motor truck. Note that sprinkler bars are in front of rear wheels



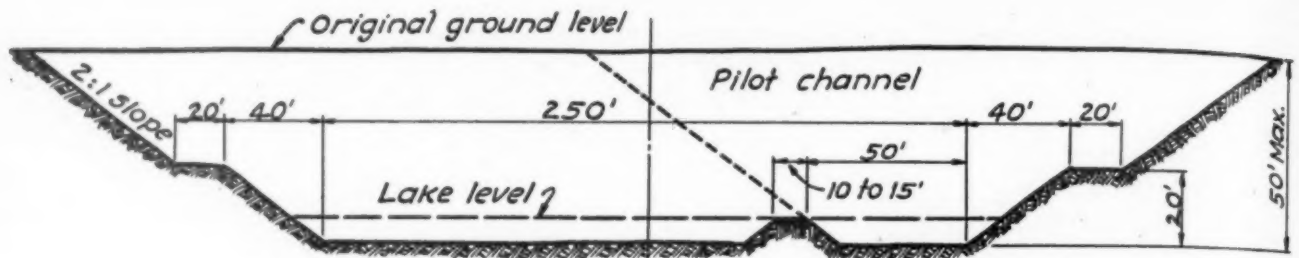


Fig. 3. Cross section of cut-off channel, showing location of pilot channel

wheel-tractor-drawn wagons were served continuously. Due to the fact that there was a grade of about 10 per cent at one end of the borrow area (at time of production observations), it was difficult to obtain accurate turn-around figures for average conditions. At the other end of the cut, which was level, a maximum of 1.0 minutes was required to turn the loader around and commence loading.

Three Field Shops

While the three grading partners pooled their equipment and moved earth under a single superintendent, they elected that each have his own field shop and service organization. Lined up in a row, the three shops were manned by a 2-shift crew consisting of as high as 119 men, comprising three foremen, 60 shop men (including 6 welders), 38 greasers, oilers and fuelers, and 18 field mechanics.

Of note is the fact that as the work was wound up, each contractor put his machines in A-1 condition, completely overhauling if necessary, and giving every unit a thorough steam cleaning and new coat of paint in readiness for moving to the next contract. A Dallas firm, G. W. Kenny, subcontracted the cleaning, using three pressure units, one truck-mounted.

Concrete Pavement Has Lime Rock and Sand Base

Raving, drainage, surface-dressing and sodding were included in a con-

tract for about \$1,000,000 held by Texas Bitulithic Co. of Dallas. New paving totaling 450,000 sq. yd. included three 5,200 x 150 ft. concrete runways with long parallel 75-ft. concrete taxiways. Designed for a 74,000-lb. max. wheel load, runways and taxiways were built to a 10½-7-10½ cross-section; runways thickened at centerline and edges, taxiways at edges.

The old white rock runways were taken up with shovels, draglines, scrapers and "pullers," mostly without scarifying. The material was stockpiled, then spread and rolled in a 5½-in. compacted layer as new runway base.

Immediately ahead of the paver, moist sand was bladed between paving forms, struck off with a shop-made tractor-drawn finegrader or screed, sprinkled and compacted to 2½ in. thickness with pneumatic roller. One 34-E dual-drum paver (with 27-E standby) made steady yardage; best 10-hr. day, 6,300 sq. yd. Material was batched at a "2-clam" plant on the field. The principal problem was the unloading of bulk cement from box cars to elevator in the high prevailing wind. A gasoline-powered tractor with vertical-lift scoop worked in the car.

Seventy-five-foot widths along runways and 12½-ft. strips along taxiways were given emulsion-type shoulder treatment. For turf, selected sand-clay top-soil containing fragments of Bermuda grass sod was loaded with a shovel from a nearby farm, dumped, bladed, disced, sprin-

kled and rolled. No seeding is required in this region if the mulch is kept watered until the grass takes root.

The project also involved tearing up of a high-pressure gas main and re-locating it across the lake for a distance of 6,500 ft. under water. United Gas Pipe Line Co. performed the work, shoving welded steel pipe ahead into the lake as each section was added and anchoring the pipe on bottom with 200-lb. concrete weights.

Hensley Field airport is leased by the Army from the City of Dallas. The foregoing improvements were carried out under the supervision of the district engineer, U. S. Engineer office, Denison, Texas.

Highway Traffic Volume Trends

Preliminary data for April 1944, according to a memorandum issued to the Public Roads Administration, indicated that traffic on rural roads was slightly less than in April 1943. Traffic in the eastern portion of the country decreased 0.6 per cent; that in the central portion decreased 6.1 per cent; while that in the western section diminished 5.0 per cent. In the entire country rural traffic fell off 4.2 per cent from that estimated for April 1943. In Detroit, Michigan, traffic counted at three stations in April 1944 was 7.7 per cent below the count at the same locations in this month in 1943.

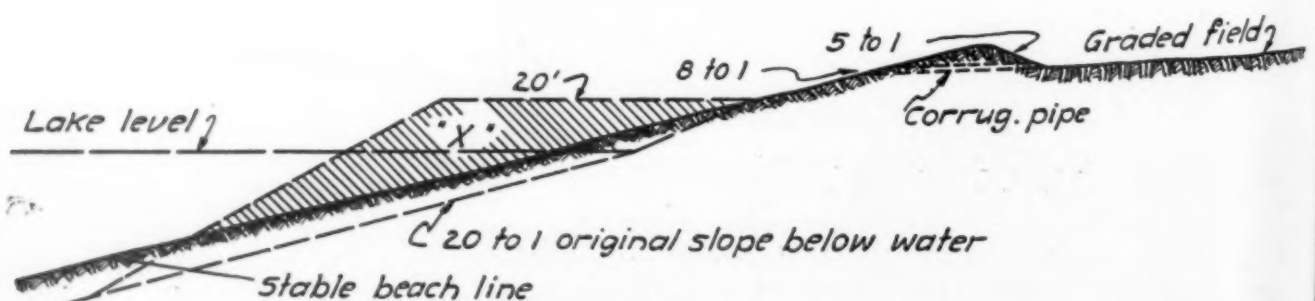


Fig. 4. Beach lines washed and tended to kick out at the toe until additional material ("X") was deposited and shoved out to form a stable beach line

Goodbye 18-Ft. Pavement Width!

—Says Indiana, on Busiest State Truck Routes

Concrete pavement widening contracts totaling 324 miles let in \$3,250,000 program; third phase in heavy maintenance and repair job begun in 1943. Notes on design details and construction methods on typical widening projects

BROAD beamed, dual-tired trucks will spend less time on the shoulders and over on the centerstripe when the Indiana highway commission gets done with its current concrete widening work. Believed to be one of the largest highway widening programs ever undertaken, it is confined almost entirely to U. S. route sections which carry the heaviest truck traffic. Mounting difficulties in maintaining shoulders alone made the program imperative, to say nothing of the present and future safety value.

Most of the pavement being widened are 18 ft., a few 20 ft. Roads which remain 2-lane after the war are being widened to 24 ft., and those expected to become part of a 4-lane divided highway, to 22 ft. No changes in line, grade or shoulder width are involved.

Widening Separate from Salvage Program

The concrete widening program is the third chapter in a wartime road preservation effort under which the Indiana highway commission had previously let 398 miles of maintenance contracts since early in 1943 and 1944. The 1943 phase consisted of urgent salvage work necessary to continue traffic, and comprised patching and reinforcing of failing sections and widening to 22 ft. where specially needed. However, no improvement other than patching was performed on sections of obsolete alignment.

Early in 1944 as a second phase, in order to stave off failure of pavements showing distress under another year of war traffic, additional widen-

resurface contracts were let. These went a step farther by including a seal and temporary bituminous binder course (but not widening or surface course) along sections of poor line and grade slated for early reconstruction.

Then, as the latest phase, came the May and June, 1944, lettings for concrete widening, which are not to salvage old pavements but to expedite traffic along pavements in good present condition, although the widening strips will certainly act as edge protection and thus prolong the life of the existing concrete. Also in contrast with earlier widening and resurfacing policy, sections selected for widening are widened continuously between points of importance regardless of distance. Consistency of width has been deemed essential to safety. Widening of certain heavy trucking routes, though urgently needed, was omitted this year where early reconstruction to correct line and grade is likely.

Altogether in 1943 and 1944, directly or indirectly as a result of the new L-41e Order, 117 miles of resurfacing is being carried out at a cost of \$1,688,000; 105 miles of resurfacing and widening at \$2,446,000; 324 miles of widening alone \$3,260,000.

Concrete pavements were selected for widening on a priority basis established by recent engineering studies. States planning survey data indicate that forty-five U. S. routes sections carry a daily average of trucks ranging from 500 to 1000. These routes came first on the list, though a few other short sections car-



Who says a 9-ft. lane isn't dangerously narrow for dual-tired trucks! Photo by ROADS AND STREETS Editor while on inspection tour with an Indiana maintenance official

rying as low as 325 trucks daily were included where they functioned as a link between more heavily used routes, or where widening would remove an isolated bottleneck.

Widening Strip Design

Uniform thickness of 9 in. has been adopted for all concrete widening not involving bituminous resurface; 8 in. with resurface. Usual width of strip is 2 to 3 ft. on either side but under special circumstances the strip may vary in width from 1 ft. up to 12 ft. Standard pavement specifications govern the concrete mix design.

Inside and outside edges of the strip are troweled with an edge of $\frac{3}{4}$ -in. radius. Construction joints are placed at the end of each day or where concrete placement stops more than 30 minutes. Specifications call for a section thickened to 12 in. in 4 ft. of distance on either side of transverse joints, and a formed keyway but no doweling.

All widening joints are sealed with hot asphaltic cement filler.

Widening, Construction Details

The state specifies that widening work must be planned to interfere as little as possible with two-lane traffic and at least one-way traffic be maintained at all times except in emergency. Trenches, completed strips during curing, and patches must be carefully guarded against traffic mis-

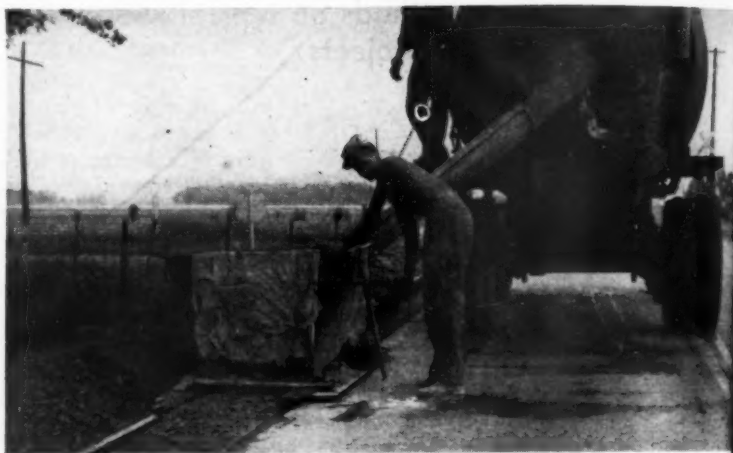


1. (Left): Preparing subgrade for the widening slab. Most Indiana contractors use a trench plow. Berns Const. Co., subcontractor for Mid-America Corp., Chicago, on U. S. 50, trenched with a motor grader



2. (Right): Note blade extension on grader blade, designed to plow just wide enough to set forms. A secondary extension (See "A") dug outer corner of trench 1-in. extra deep to permit the use of 9-in. available forms for an 8-in. slab

3. (Below): Placing and spreading concrete. Done on Rieth-Riley Const. Co.'s U. S. 31 job by chuting from ready-mix trucks into a specially built spreader or screed box, towed along by the truck



4. The spreader box struck off the concrete, leaving a slight excess over that needed for the mechanical finisher

5. (Lower left): Contractors on Indiana's current widening work usually employ mechanical sidewalk finishers. Note wheel barrow, used alternately to pick up sweepings from alongside finished strips, and to carry excess concrete from in front of the finisher and dump it ahead of the spreader box

6. Edging operation. All concrete widening strips and patches, whether to be covered with bituminous resurface or left exposed, are edged to $\frac{3}{4}$ -in. radius under Indiana "specs."



ing slab.
r. Berns
P., Chi-
der



7. Final finishing is given with a light T-stick following use of heavier float shown in foreground. The Rieth-Riley crew used long-handled finishing tools to save back-bending labor

8. Curing specifications called for burlap the first day, followed by liquid membrane or moist earth cover (alternate). Barrels set at 100-ft. intervals protected the strip against traffic



10. Binder course is applied this year on worn sections even where early reconstruction to correct poor alignment or grade is probable

11. Rolling hot binder course on U. S. 31 N. of Indianapolis. Brooks Construction Co. of Ft. Wayne hung a light wood frame back of their roller as shown, to warn workers when roller suddenly backs. Brooks' 8.32-mile contract included 16,000 gal. seal prime at 8c; 7,200 gal. seal at 8c; 13,105 ton hot-mix binder at \$5.34; 180 tons covering aggregate at \$3.00; 1,900 tons rock asphalt for 1/2-in. wearing course at \$15.06; 830 sq. yd. concrete patching at \$5.00



12. As a general policy in Indiana one-lane traffic is maintained around equipment, 2-lane at all other times, during widening and resurfacing work



9. Continued proper curing was assured by sprinkling earth cover daily with side spray bar





More scenes on Berns Const. Co's U. S. 50 patching-widening-resurfacing job. Left: a typical patch with troweled edges. Right: First steps in cutting out for a patch on both sides of a corner failure area. This pavement has suffered under wartime overload after years of good service



haps. Some contractors use saw horses. Others use oil barrels, spaced every 100 ft. or so.

Placement at rate of at least 1,000 sq. yd. of pavement strip per day (or roughly 3,000 lin. ft. of 3 ft. widening) is required in the contract, once concreting has begun. However, completion of a mile a day has been common place on well organized jobs.

Shoulder trenching is the step in which contractors have used the greatest variety of equipment. Berns Construction Co., on U. S. 50 near Seymour (a widen-resurface job), preferred to trench with a motor grader having a blade extension the width and depth of the trench. On this firm's contract, which called for 8-in. concrete, a narrow second blade extension notched the trench down an additional inch to allow for use of 9-in. forms. A motor grader is handy for this work, but not ideal because of difficulty in keeping the front wheels from dropping into the ditch. Other contractors prefer various types of tractor-drawn trench plows or mechanical trenchers.

Some widening contracts specify that widening subgrades needing correction be excavated and backfilled with Grade "C" special borrow, which is material 0-5% retained on 2-in. sq. sieve, 0-65% on No. 4 sieve, and containing sufficient border material to aid compaction so that the fraction passing No. 200 sieve is not greater than $\frac{1}{2}$ the fraction passing the No. 30 sieve.

Forms are one of the big items on widening. Where a mile-a-day pace is maintained about 6,500 to 7,000 ft. of forms are necessary, and even that footage calls for close timing in removing forms and trucking up ahead.

A trench roller is standard equipment, though not definitely specified.

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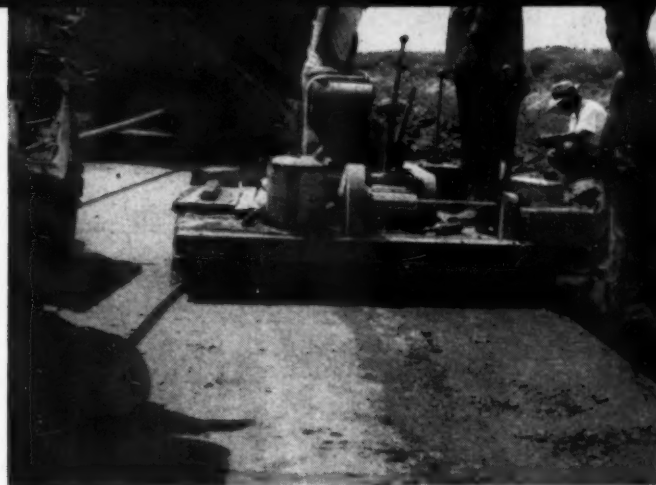
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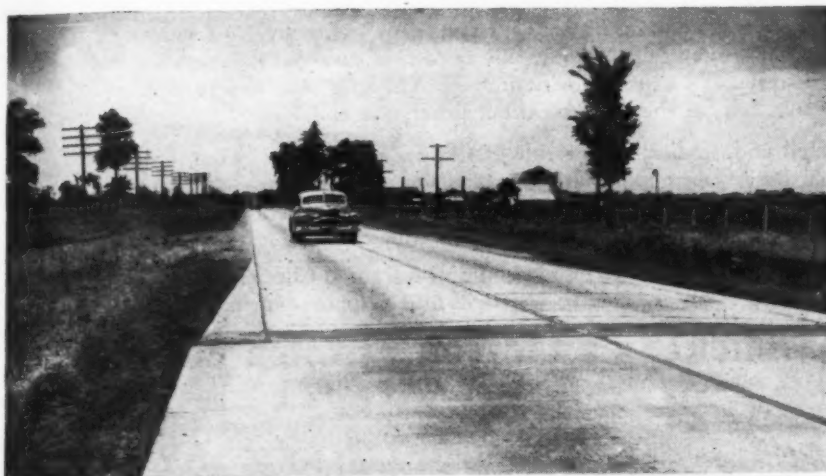
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Berns rolled his widening base with a trench roller, fine-graded with a home-made towing screed, chuted concrete from a 27-E paver, followed by a mechanical sidewalk finisher



What a whale of a difference! New-standard 24-ft. concrete pavement making transition with older 18-ft. section on U. S. 31 south of Indianapolis. WPB has approved widening 325 miles in Indiana to 22 or 24 ft., to expedite heavy trucking

Specifications call for compaction of the subgrade to the equivalent of that obtained on open subgrade by a 10-ton 3-wheel roller. Berns Construction Co., Chicago, subcontractors for Mid-America Engineering Corp. on U. S. 50 widening work this year, used a typical fine grading device on a 2-ft.-wide strip. It consisted of a specially made blade outfit which rode the forms and pavement edge, drawn back and forth on a tow bar behind the trench roller. Some hand shoveling of subgrade material was necessary.

Ready Mix vs. Pavers

Concrete is being placed on most jobs by a standard paver, using a chute instead of arm and drop bucket. Specifications call for a 2-bag or larger mixer when a mixer is used. Rieth-Riley handled its 10.2-mile U. S. 31 contract with 5 to 7 company-owned 4-yd. ready-mix trucks, hauling from 1 to 6 miles. A truck took 4 minutes to unload, each load taking care of 72 ft. of 8 x 27 in. widening. Concrete was chuted into a spreader

box which, when towed by the paver or ready-mix truck, deposited slightly in excess of the exact amount of concrete for the finisher.

Nearly all Indiana widening contractors use mechanical sidewalk finishers, although in the latest lettings the use of a finishing machine was made optional to allow a contractor to employ a heavy hand strike-off, should machines be unobtainable.

Finishing consists of hand floating, with a small, heavily-constructed, long-handled float, followed by edging and either rough troweling or drawing a light wood float along to take the place of belting. Some outfits have the edging trowel mounted on a long handle, which speeds this operation by keeping the finisher up off his knees.

Careful scraping up and removal of concrete and mortar scum from the existing pavement adjacent to the completed strip is an important detail. Another is use of a wheelbarrow to pick up surplus concrete ahead of the finisher and dump it ahead of the concrete spreader box.

Curing routine consists of covering with wet burlap for several hours, then curing for 7 days with either moist earth or liquid membrane covering compound, the latter now being optional. Earth is usually kept sprinkled by a truck equipped with a short sprinkler bar on one side. Difficulty is encountered occasionally in keeping vehicles off of membrane curing; barricades need to be located at about 100-ft. intervals.

The trench left along the new strip in removing forms is required to be backfilled in two layers and each layer rolled with the tires of a 4-ton or heavier truck.

Concrete Patching Instructions

Due to the fact that there is an increasing amount of concrete pavement patching being done, both by force account and by contract, the Indiana Highway Commission has found it advisable to develop a
(Continued on page 82)

Fine grader testing template, on Berns job



THE G.I. SHOVEL WITH THE HIGH I.Q.



This Buckeye equipment will save on your post-war jobs!

Buckeye "Centro-lif" Bulldozers and Trailbuilders, Cable Control Units and other Tractor Equipment, Spreaders, Trenchers, Road Wideners, R-B Power Fine-graders.

U. S. Coast Guard Photo.

American construction equipment has become a potent weapon; is giving a good account of itself on every front. As always, some pieces of equipment are giving outstanding performance, and the Buckeye Clipper is one of them. The U. S. Army does not endorse any product—plays no favorites—which is fair all around. But men in the service, from our town and elsewhere, former shovel operators and even some of our employees in the service overseas, tell us what a swell job Clippers are doing. We quote:

"You don't need a high I.Q. to run this G.I. shovel—it practically runs itself. Vacuum power control sure makes it easy to handle. It's easy to maintain, too. The guy who designed it sure felt for the 'Joes' on the maintenance end."

Well said, soldier! The trickle of Clipper repair parts going to operational bases bears out that last statement. Clippers are getting more abuse at the "fronts" than they ever got on construction jobs, in clay and gravel pits or in material yards, but they can take it.

We've had to put off a lot of people who wanted Clippers—war comes first. Those who are able to wait will find Clippers worth waiting for.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO



Buckeye Clippers

CONVERTIBLE SHOVEL—CRANE—TRENCH HOE

with
exclusive
MEVAC
METERED
VACUUM
POWER
CONTROL

ROADS AND STREETS, July, 1944



Clearing runways of heavy frozen snow at the Burlington, Vt., municipal airport. Depth of snow fall: 40 in. Area cleared: two 3,600-ft. runway strips, 250 ft. wide, plus taxiways and apron. Method: Using one heavy truck plow and one rotary, snow is plowed back into windrows, then blown over the shoulder lines as shown. Time for clearing: 66 hours of rotary work

Snow Removal, a Major Operation in Northern Vermont

Labor saved through severe winter by use of salt instead of sand-salt mixture and special sidewalk sanding equipment; snow trucked from business district at 21c per cu. yd.

THIS is a good time to stop and review our work of handling snow, with all of its attendant headaches, comprising the "Major Operation of the Winter", in Northern Vermont. Public Works Officials who have the responsibility of keeping the traffic rolling during the winter months, generally keep an accurate account of the costs of such work from year to year, in order that they may better estimate and plan for succeeding years.

Costs Hard to Estimate

Owing to the fact, however, that the cost of winter maintenance and snow removal is directly dependent upon weather conditions and the whims of Nature, there is no sure way of estimating in advance what this work for any given winter will cost. The best we can do, is to average the costs of preceeding years and arrive at a figure that represents a medium of costs for years of heavy and light snowfall and then hope for a normal year. In arriving at such an estimate, however, it is well to keep in mind that each succeeding year brings with it an increasing demand from the traveling public for more prompt service in plowing and clearing the snow from the streets and highways and maintaining sur-

By **GEORGE C. STANLEY**
City Engineer & Supt. of Streets,
Burlington, Vermont

faces free from ice and ruts and safe for travel at ever increasing speeds.

In arriving at an estimate of our probable snow removal costs for purposes of our Annual Budget last June, I took into account all of the factors mentioned above and set my Street Department Budget at \$20,000 (not including work at the municipal airport), or \$2,000 larger than the previous year. I did not anticipate, however, that this would be the year that we would be visited by the most severe snow storm in 37 years, before Thanksgiving Day, with no frost in the ground, and accompanied by a 40-mile gale of wind which piled the 22 in. of snow into huge drifts, which cost us over \$8,000 to remove, or 40% of our total budget *before our normal winter period had set in.*

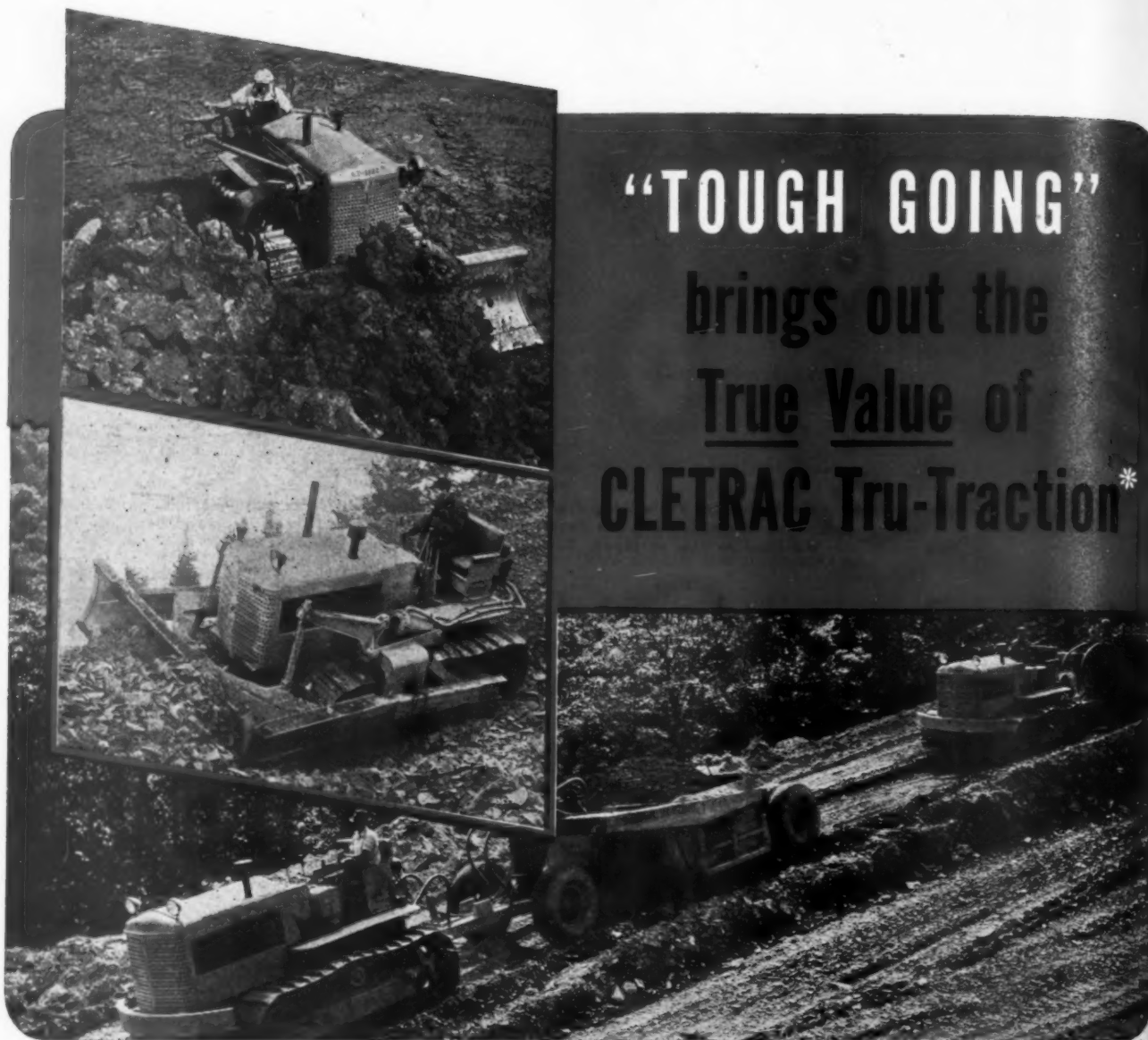
Burlington, with a population of approximately 28,000 has nearly 75 miles of streets including a few newly developed unaccepted streets and park drives that must be kept open for winter traffic. The Street Department also does all maintenance work at the municipal airport, including snow removal from three hard-surfaced runways 150 ft. x 11,500 ft.

combined length as well as two concrete taxi-ways each 50 x 3,000 ft. These runways and taxi-ways must also be sanded whenever weather conditions render them hazardous, because of ice and sleet.

Municipal Equipment Used

To accomplish all of this snow removal work and sanding of slippery streets and sidewalks the Street Department has about 50 pieces of various types of equipment as follows:

- 20—Trucks, heavy and light duty
- 10—Blade snow plows
- 1—Snow King Rotary Plow, for loading snow into trucks for hauling snow from business streets; and for plowing snow off runways after plowing into windrows on the edges of the hard surface.
- 1—Bulldozer with a straight blade and an angle blade, for cleaning the streets of hard packed snow in advance of the loader, and for clearing areas at the Airport which are inaccessible for the heavy-duty truck plows.
- 1—Bucyrus-Erie 10-B power shovel.
- 1—Universal crane, with clam shell bucket mounted on Mack truck.
- 4—Tractors, light-duty rubber-tired.
- 4—"V" type sidewalk plows.
- 4—Trailer type sand spreaders



“TOUGH GOING” brings out the True Value of CLETRAC Tru-Traction*

IN soggy tropical jungles . . . in muck and mud of Alaska . . . on bottomless roads in Russia . . . on the rugged hills of Italy . . . the mighty power of military crawler type equipment with *controlled differential steering* has been proved again and again.

Controlled differential steering is, and has been for 25 years, an *exclusive* operating feature with Cletrac. We call it *Tru-Traction*, because it gives power on *both* tracks at *all* times, and the ability to steer with the tractor under full control—uphill and down.

Today, practically all high speed military crawler type equipment uses *controlled differential steering* which is exclusive with Cletrac in the crawler tractor field.

In civil activities as in military movements . . . in logging camps . . . in highway construction . . . in oil fields . . . for heavy hauling, bulldozing or earth moving, wherever the going is tough—Cletrac can be depended upon to do the job—and do it economically.

A substantial number of Cletracs are being released for essential civilian use—allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

• • •

Illustrated at the right, below, is a folder recently published, telling of Cletrac's part in the war effort. A copy will be mailed on request.

*Tru-Traction is power on both tracks at all times.

THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO

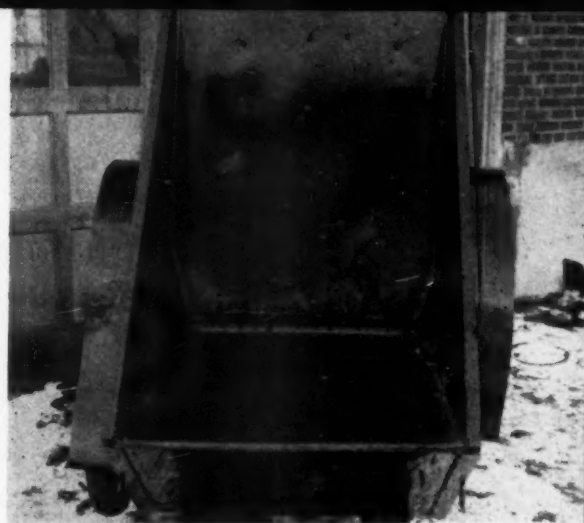


CLETRAC *Tru-Traction* TRACTORS

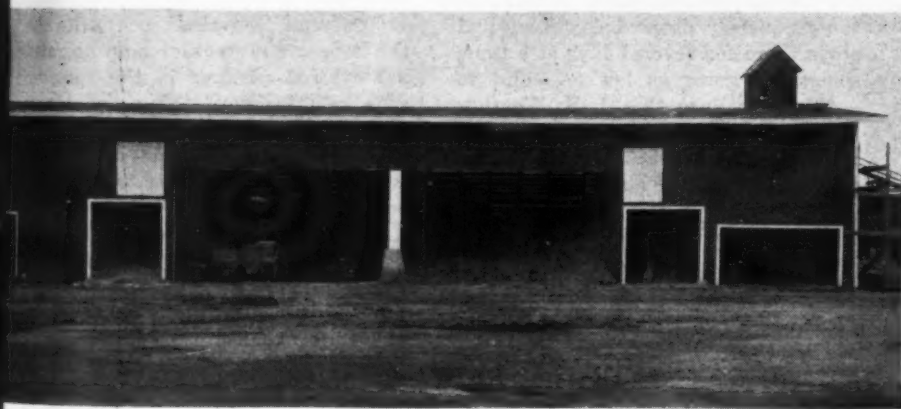
CATOLINE ON BIRREL



ROADS AND STREETS, July, 1944



The two upper scenes and the one on the right show details of one of Burlington's special sidewalk plowing and sanding units. It consists of a rubber-tired tractor with 5-ft. "V" blade and a trailer sand spreader, designed and built in the street department repair shop. Burlington forces prefer the V plow to reversible blade for walks, specially after heavy storms. Note metal weights on rear hubs, to give more weight and traction. The 1/2-yd. spreader box has a sloping false bottom lined with sheet metal which assists flow of sand to rotor placed at rear of main axle. The rotor surface is covered with steel beads which operate against a steel fiber brush to deliver a 30-in.-wide sand carpet over the walk. Note small wheelbarrow wheel, which makes contact, the trailer wheel and transmits power to the rotor through V-belt. Pressure or friction of the small wheel is controlled by a lever operated by the driver. Note idler wheel to take up belt slack



(Left): New municipal storehouse at Burlington, built of available materials by city forces during occasional slack days. Center bays are for storing street sanding materials in winter, sand boxes and other sanding equipment in summer. Smaller bins on either side are for rock salt, each holding one carload. Space upstairs behind white doors houses snow fence

(Right below): This rotary outfit loads a 10-cu. yd. truck body in 45 seconds when snow is fine, but a small Ford truck load takes much longer in this stuff which is not broken concrete but merely compacted snow and ice peeled from gutters

(Left below): Light V-plows for sidewalks are still indispensable in northern cities





which were designed and built in our own shops.

- 4—Sand spreaders which are attached to the dump trucks by removing the tailgates.

The work of plowing snow begins with each storm as soon as there is a depth of 2 inches. Generally the process continues without a stop until the job for that storm is completed, including the hauling of the snow from the business areas. Because of traffic and parked cars, downtown clearing is usually done at night.

During the storm of Nov. 22 and 23, 1943, more than 1500 10-cu. yd. truck loads of snow was loaded and hauled off the business streets.

Loading, Hauling at 21c a yd.

The snow is dumped off the docks into Lake Champlain until the lake freezes, then it is dumped on City owned land in large open areas near the lake where it will melt and run off in the spring without damage to surrounding property. The Street Department loaded and hauled off more than 4,000 loads of snow last winter at a cost of about \$8,400 or a unit cost of 21c per cu. yd. This figure includes all costs of plowing from streets and sidewalk areas, loading, hauling to the dumping site and disposing. Disposing also includes a dump foreman and a bulldozer with

operator for keeping the dumping area in proper condition.

Dry Sand Boxes Aid Sanding

In order to cut down the hazards to pedestrians and to winter drivers, the Street Department has for many years sanded the streets and sidewalks with a mixture of sand and rock salt whenever they became slippery from sleet or ice storms or from packed snow. Another service is that of placing sand boxes at street corners and filling with about one cubic yard each of dry sand. This sand can be used for sanding driveways and private walks as well as the main walks. Sand is run through the municipal asphalt plant dryer to dehydrate, thus insuring it against freezing in winter while stored in the boxes. Temperature in Burlington frequently drops below zero and stays there for several days at a time, sometimes going as low as -30° to -40° . I believe the U. S. Weather Bureau record shows about 30 sub-zero days for the 1943-44 winter. The average is about 19 such days.

Labor-Saving Steps

In order to meet the manpower shortage we have had to resort to a great many short-cuts and revise our schedules in many ways. Several instances are as follows:

1. We saved labor and increased

Specialty built rock salt hopper used on Burlington streets. It is made from scrap sheet metal with 2-in. pipe over which is telescoped a 2½-in. pipe with chain for adjusting height of discharge above the pavement to accommodate various truck bodies. One man shovels into hopper as truck moves in lane to right of center line, thus spreading salt in a narrow width on the crown where it melts under traffic and is dispersed toward the gutters

our efficiency without lessening service by changing the design of our sidewalk sand spreading machines so they could be operated by one man instead of two as previously required.

2. Substituted rock salt applied straight, instead of a sand-salt mixture to about 20 miles of heaviest traveled streets (including U. S. 2 and 7) as well as the entire business blocks and several bus routes, especially those leading to a local war industry plant. From a few pieces of scrap sheet metal and 2-in. pipe we built two salt spreaders or hoppers in our own repair shop. These hoppers were clamped over the side of the truck body, generally the left side, and the truck proceeded along the traffic lane to the right of the center line of the street at a speed of from 15 to 18 mph. without interfering with traffic.

One man shoveled rock salt into the hopper and another man operated a steel rod plunger in the spreader pipe to prevent clogging and insure even distribution of the salt. This arrangement permitted two trucks with two men each to cover 20 miles of streets in about an hour, and do a much more effective job than could possibly be done with the sand and salt mixture. We used about 350 lb. of salt per mile of 35-ft. pavement, or about 3½ tons for each application over the 20 miles. To have covered the same streets with the mixture of sand and salt would have required several times the quantity of materials and consumed several hours of labor with men and trucks as well as use of the power shovel for getting pit sand to the stock pile, mixing it with salt, and again loading the sand from the stock pile, and spreading it on the streets.

Another saving from this change in procedure will be the time we will save in the spring when the sand has to be cleaned off the streets or out of the gutters or catch basins. This method has not only saved money and manpower, but has prevented the formation of ice ruts and hard packed snow on the surface of our streets.

(Continued on page 85)

Showing result of use of salt to aid snow removal and safe driving. Compare height of adjacent snow banks with complete absence of snow on traveled surface a few hours after salt application



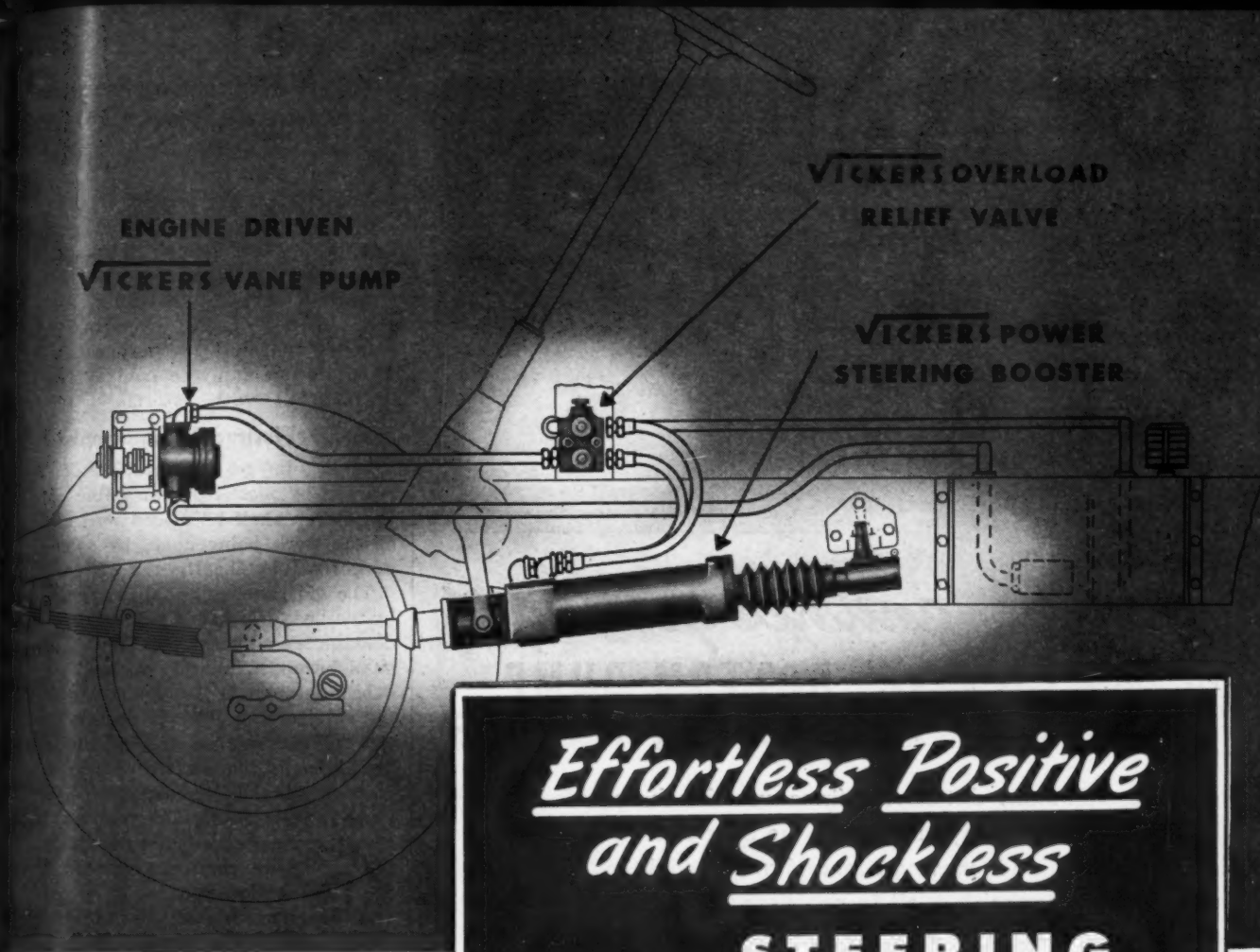
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Effortless Positive and Shockless **STEERING**

VICKERS HYDRAULIC POWER STEERING

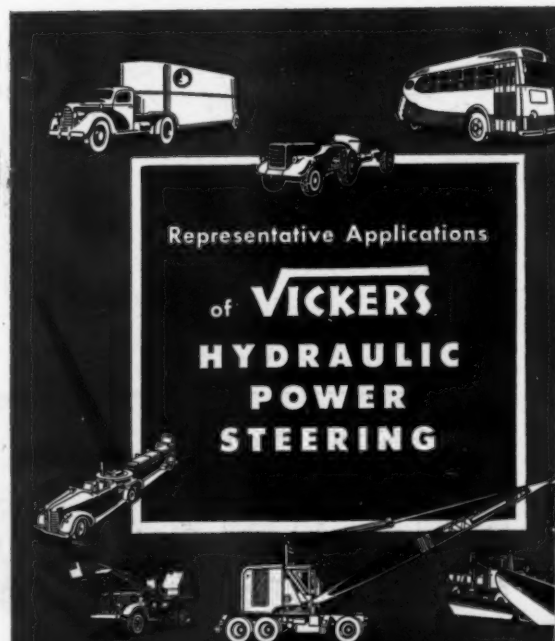
A giant truck steers easier than a "jeep" . . . when that truck is equipped with the Vickers Hydraulic Power Steering System. The driver can turn the steering gear with his fingertips, and the front wheels follow exactly. All the work is done by a hydraulic cylinder (booster) which utilizes pressure from the engine-driven pump . . . the steering effort is not transmitted through the steering gear.

No road shock can be transmitted to the driver . . . road shock thrusts are transmitted to the frame instead of to the steering gear. With Vickers Hydraulic Power Steering, a vehicle can be driven over a curb, through sand, and on rough ground with no fight from the wheel. A flat tire will not cause swerving. If the hydraulic pressure becomes inoperative for any reason, operation automatically reverts to manual steering.

Compact . . . easily installed . . . simple . . . dependable . . . Vickers Hydraulic Power Steering is becoming a "must" on many heavy vehicles of all types. Write for details on this powerful antidote for driver fatigue. Ask for new Bulletin 44-30.

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with **HEIL** **BOTTOM-DUMP TRAILER WAGONS**

Before the war, many dirt-moving firms were breaking speed records with this Heil unit. Today, the men of the armed services, too, are doing the unbelievable in moving a lot of dirt, in record time. Dumping is under fingertip control . . . all in one heap, or with an even spread. Doors are power-opened — in 2 seconds — under cable control (they close by gravity). You get a 35 inch clearance with the doors wide open — no dragging — nothing to slow up the unit. The operator turns off the windrow at sharp angles whenever he chooses. Place your order now for early post-war delivery.

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THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN

Indiana's Widening Program

(Continued from page 75)

standard procedure for the performance of this work.

Noted below are several of the instructions listed for locating and establishing the size of the patches (to be used by superintendents, foremen in charge of patching crews, and engineers and inspectors on patching contracts). The paragraphs which do not apply to contract work are marked with asterisk (*).

General Instructions (Incomplete)

Areas to be patched shall be marked by means of paint lines, and the marks shall be placed well ahead of the work being done, by someone authorized by the District Office.

The old pavement shall be removed by methods which will not excessively damage the adjacent pavement. Edges shall be approximately vertical. The subgrade shall be levelled to provide for patches 8 or 9 in. in depth.

* Tie bars across the center joint remaining in place after the concrete is removed, shall be straightened and placed in their original position, before being embedded in new concrete. Marginal bars shall be removed, except in short locations.

At locations where the patch is to extend completely across the pavement, the removal shall first include one side only, plus approximately one foot beyond the center line, and soil placed between this form and the portion of pavement which has not been removed. After the first side has been concreted, and curing completed, this new concrete shall be opened to traffic. The wood form shall then be removed, together with the remaining concrete pavement, and the patch completed. This method of construction will result in a butt joint coinciding with the center line of the pavement.

If the subgrade is in poor condition, grade "C" Special Borrow may be placed beneath the patch. In some cases it may be advisable to provide for subgrade drainage.

* Standard pavement concrete is specified, except for very small patches, where class "D" structural concrete may be used. High-early-strength concrete is recommended.

* In general, transit mix-concrete has proved to be more economical than concrete mixed on the job, if there is a transit-mix plant available.

The concrete being placed shall be as dry as possible and still remain workable.

Concrete shall be tamped thoroughly and the edges, including the

form line, spaded. On large patches, regular strike-off boards shall be employed. A float finish shall be used, except in locations where the adjacent concrete has a broomed finish. In this case, a street broom may be used to approximate this finish.

After finishing, all edges along the outside form and adjacent to old concrete shall be edged with an edger having a $\frac{3}{4}$ -in. radius, unless otherwise instructed.

If the patch extends completely across the pavement, the joints need not be replaced. On patches which do not extend completely across the pavement, existing joints must be replaced within the patch, with joints of a similar nature and in the same location.

* The newly placed concrete must be protected by means of wet burlap, until it is dry enough for wet straw. The length of curing period is established by the District Office upon the basis of a 550 lb. beam test strength. Membrane curing is recommended when available.

1. In general, all sides of a patch will consist of straight lines.

2. If there is an existing crack near point where patch is to end, this crack may become one side of the patch, providing it is in an approximately straight line.

3. The edges of a patch must be straight enough to meet the following requirements.

The maximum deviation of any point on the edge from a straight line connecting any two points on the edge shall be:

Deviation	Length of Straight Line
6"	9'
4"	5'
2"	2'

4. If an existing crack is used as an edge, any inferior concrete adjacent to the crack shall be removed, and the edge thoroughly cleaned.

5. The ends of a patch shall be approximately at right angles to the center-line, and shall not deviate more than 30° from a right angle.

6. Patches shall extend from the edge of the pavement towards the center either a distance of from 4 to 6 ft, or to the centerline. They may also extend from the centerline towards the edge a distance of from 4 to 6 ft. These provisions are to prevent a longitudinal joint from falling within a "wheel path" area.

7. All patches shall be not less than 4 ft. in length, if there are no joints or cracks immediately adjacent. They shall extend not less than 4 ft. on one or both sides of a contraction joint, and not less than 6 ft. on one or both sides of an expansion joint.

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famous Heil Cable Dozers will be available. Now, they're needed for the tougher job of clearing the way on the fighting fronts . . . digging in to soft dirt or hard-packed clay with ease . . . leading the way for men and equipment in their march toward victory.

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team. The simplified mounting avoids obstructing the operator's view — gives him full vision ahead. Here is a machine that performs smoothly — gives fast, positive action under the toughest conditions, with minimum maintenance. Get yourself a post-war "priority" by placing your order now.

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B-31

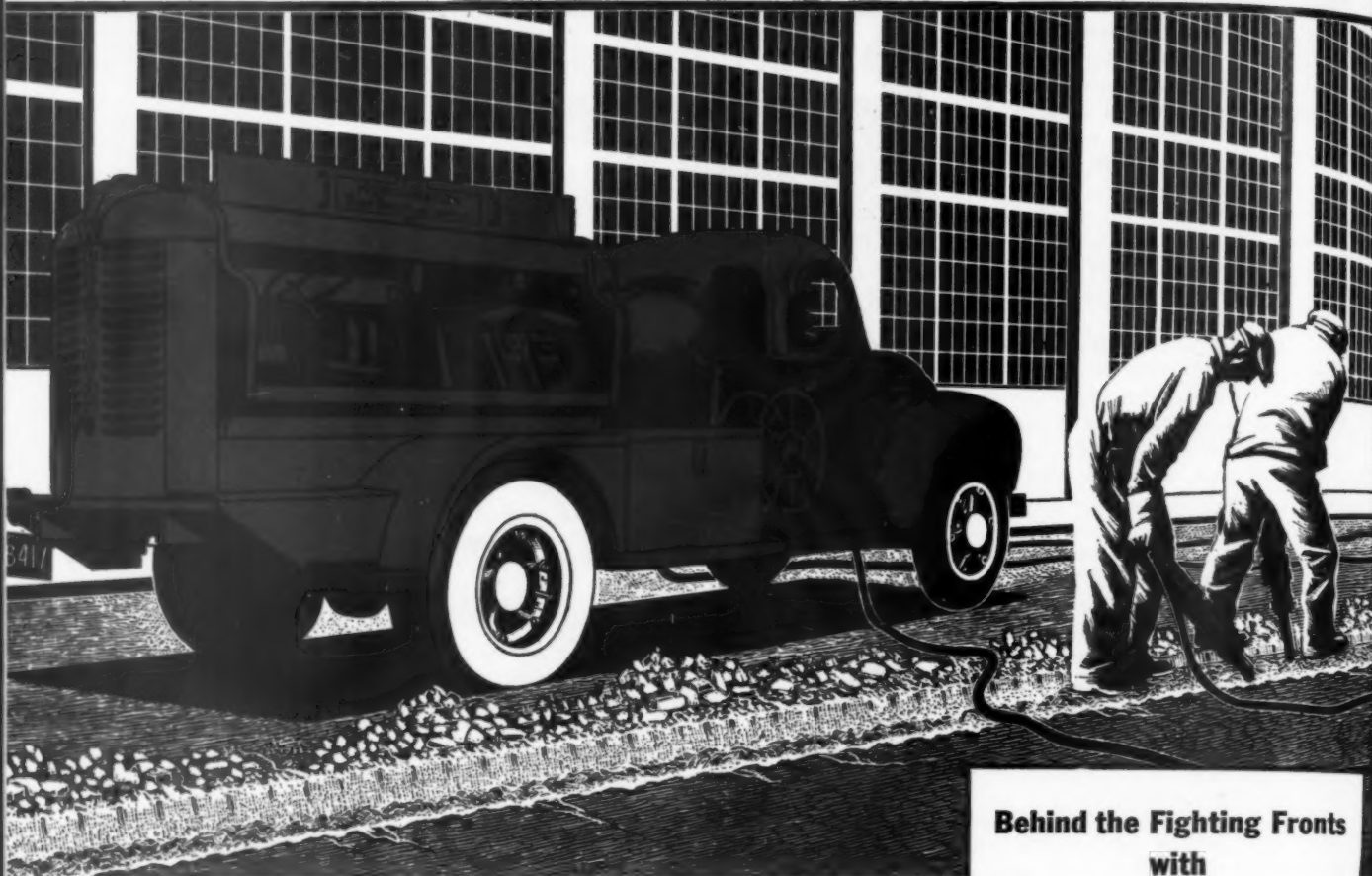
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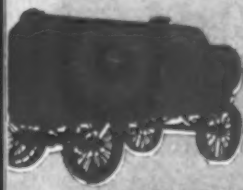
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always set the pace for easy operation—available in a wide range of weights and sizes.

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Blue Brute

Worthington Pump and Machinery Corp.

Snow Removal in No. Vermont

(Continued from page 80)

The salt has quickly melted the small amount of snow left on the surface of the streets by the plows after each storm and presents a clean dry pavement, thus preventing accidents which might otherwise have happened.

Salt Has Public Approval

This method of snow removal or winter maintenance as it should rightfully be called, has met with ready approval from the general public and business people and will be continued with increasing success as new means of application and new methods of its use are devised.

Snow fall last winter totaled about 80 inches. The heaviest fall, Nov. 22 and 23, was 22 in. during a continuous 48-hour storm. December brought only slight snow flurries, about 3 inches, January followed with three storms of 12, 4 and 6 ins., and February broke the record with six storms totaling 30 in. plus a 2-in. rain. Several snow flurries occurred in March, heaviest storm 3 in.

Our snow fences, of which we have nearly 3 miles placed in open spaces where the snow drifts with high winds from the North or South, has been of great help in preventing drifted sections of streets and highways last winter as we had an unusual number of high-velocity storms. Some fences were nearly covered with snow.

Our equipment, as shown in accompanying photos, will be readily recognized as having given many years of service. But our own mechanics, aided by our Vermont tradition for thrift and economy, hope to be able to make them last for the duration.

The total cost of snow removal for Burlington last winter up to March 21 (first day of spring) was \$36,244,

of which \$8,595 was expended at the airport and \$27,648 on streets and sidewalks. These figures include all phases of winter maintenance. This, you will note, is just about the amount of my original estimate for our Annual Budget for this year plus the amount expended for the unseasonable and unpredicted, storm of Nov. 22.

A tabulation of the various phases of the snow removal work and their separate items of costs are here given.

These costs represent the work of winter maintenance on about 120 miles of sidewalks and 75 miles of streets which, if broken down into unit costs, would average about \$22 per mile for sidewalk maintenance and \$333 per mile for street maintenance.

Stated in terms of unit cost per inch of snow fall, the actual plowing of the snow from our sidewalks cost about \$10 per inch of fall; for street plowing, \$75 per inch of fall; and for plowing, \$72 per inch of fall; and for business streets, \$103 per inch of snow fall.

In conclusion, I think you will agree after considering the foregoing data and looking at the accompanying pictures that snow removal or winter maintenance in Northern Vermont is a "Major Operation," and one which if successful, must be performed with as much science and precision as is generally required of the most skillful surgeon.

Florida Overseas Highway Article

The story carrying the title "Overseas Highway Now Completed" published in June, was prepared by N. S. Emery, division engineer, State Road Department of Florida, Fort Lauderdale, who had jurisdiction over the project. His name as author was inadvertently omitted.

City of Burlington, Vermont (Pop. 28,000), Snow Removal Costs, Season 1943-1944

Items of Work	Labor & Equipment	Materials	Totals	Total Costs	
				St. Dept.	Airport
Sidewalk Snow Removal					
Sanding	\$ 1,333.81	\$ 356.00	\$ 1,689.81		
Plowing	917.32		917.32		
Cost Sidewalk Snow Rem.				\$ 2,607.13	
Street Snow Removal					
Sanding	\$ 6,028.58	\$ 1,639.80	\$ 7,668.38		
Plowing	5,230.81	494.86	5,725.67		
Loading & Hauling.....	8,271.24		8,271.24		
Cleaning Cross-Walks	779.44		779.44		
Erection of Snow Fence...	369.83	8.48	378.31		
Spreading Salt	100.04	350.00	450.04		
Miscellaneous Work	1,525.47	242.81	1,768.28		
Cost Street Snow Rem..				\$25,041.36	
Airport Work					
Sanding	\$ 121.78	\$ 235.00	\$ 356.78		
Plowing	8,152.37		8,152.37		
Miscellaneous	46.43	40.03	86.46		
Cost Airport Work.....					\$ 8,595.61
Totals	\$32,877.12	\$ 3,366.98	\$36,244.10	\$27,648.49	\$ 8,595.61

ROADS AND STREETS, July, 1944

Any Old TAR-POT Won't Do!



HANDLE PATCH MATERIAL CAREFULLY

Burned bituminous material will disintegrate—material that is too *cold* will not penetrate properly. The most important factor in controlling temperatures to insure correct application is the Tar Kettle.

On a STANDARD STEEL Model "S" Kettle, the instantly adjustable burner is big and fast—provides ample heat for *even penetration of the entire mass of material*, and ample heat to *keep the temperature steady*. Scientifically located louvers *carry the heat to all parts of the vat*—no "cold spots" to cause application failures.

Low height makes loading easy—wide, deep anti-splash protects the operator from hot material. Heavy duty, highspeed chassis makes possible fast, safe towing.

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Post-war Planning Notes

Wisconsin counties will correlate their post-war road planning to fit in with a state-wide county trunk road improvement program, it was decided at a recent joint meeting of state and county road officials at Madison. Each county is to sectionalize its county trunk roads, and each piece of road within certain control points will be numbered under a plan of uniform accounting if the system is adopted. A condition survey is to be made for each piece of road and the proposed type of improvement and estimated cost listed.

* * *

New York City Board of Estimate and Borough Advisory Planning Board Postwar Committee has received plans for a Manhattan crosstown highway. Of eight different engineering studies submitted, the Borough president recommended a double-decked, elevated expressway. Cost of the structure is put at \$14,819,000.

* * *

At a meeting in Chicago recently, attended by top municipal officials, co-operation of their respective agencies was pledged to the special American Society of Civil Engineers' program involving all phases of public and private construction. The program has been under the direction of G. Donald Kennedy, vice-pres. Automotive Safety Foundation in his capacity as chairman of the ASCE Committee on Postwar Construction.

An agreement was made by the ASCE Committee with the Committee for Economic Development to correlate public works planning with community CED activities.

In attendance at the dinner meeting were:

Mayor Wilson W. Wyatt, Pres., American Society of Planning Officials, Louisville, Ky.

Herbert A. Olsen, Pres., American Municipal Assn., Ann Arbor, Mich.

Frederick R. Storrer, Pres., American Public Works Assn., Dearborn, Mich.

Herman G. Pope, Exec. Dir., Public Administration Service.

Walter Blucher, Exec. Dir., American Soc. of Planning Officials.

Earl Mallery, Exec. Dir., American Municipal Assn.

Frederick Bass, Executive Dir., American Public Works Assn.

Hugh Pomeroy, Exec. Dir., National Assn. of Housing Officials.

Clarence Ridley, Exec. Dir., International City Managers Assn.

Herbert Fritz, Assist. Dir., American Works Assn.

In attendance as members of ASCE Committee on Post-War Construction:

G. Donald Kennedy (chairman) Vice-Pres., Automotive Safety Foundation, Washington, D. C.

Frank T. Sheets, Pres., Portland Cement Association, Chicago, Ill.

Gustav J. Requardt, Consulting Engineer, Whitman, Requardt & Smith, Baltimore.

Vincent B. Smith, Executive Dir., Research and Development Division, New York.

Mark B. Owen, Dir., Research and Development Division, New York, (Past Pres., American Public Works Association).

D. Grant Mickle, traffic engineer, and John Cummings, also represented the ASF.

* * *

Nine hundred post-war project applications have been made by up-state communities to the New York State Post-war Public Works Planning Commission. Value: \$93,000,000; plans cost: \$1,195,000. New York City has

submitted 1608 projects for \$73,000,000, which are in addition to the city's own billion-dollar post-war plans.

* * *

A recent staff progress report (No. 3) of the Illinois Post-War Planning Commission, E. Roy Wells, chief engineer, reports the following volume of proposed municipal projects:

Local city projects: street improvements, \$37,328,000; bridges and grade separations, \$19,031,000; airports, \$4,228,000; total including all other public works, \$169,000,000. Detailed plans done or in progress on 18 per cent, sketch plans on 21 per cent, surveys on 9 per cent, estimates only on 52 per cent.

Chicago, governmental units have compiled \$1,225,000,000 in desirable projects. Illinois counties, \$110,500,000, 44 per cent in active construction plans stage.

* * *

Among items called for in a state-directed program to revitalize Chicago and its metropolitan, Governor Green recently called for the presentation of post-war plans and suggestions for a super-highway system for the Chicago area, incorporating "all that has been learned in road building as planned for other cities since Pearl Harbor" (including review of city's Congress Street plan); new consolidated rail passenger terminal and suburban rail-service; expanded air-port facilities, including an airport-downtown expressway; further development in lake and river commerce; and fast anti-truck ferry service across Lake Michigan employing converted aircraft carriers.

Airport Bill Calls for \$2,000,000,000 Program

A bill, H.R. 5024, was introduced in the House of Representatives on June 14 providing for the expenditure of \$1,000,000,000 in federal funds for airport development. The administration of the bill would be placed under a newly created Director of Airport Service under the Civil Aeronautics Administration.

Following the general plan of Federal-aid for highway construction, the bill requires the establishment of "state airport agencies" and all funds would be apportioned among the states under a legislative formula. The formula provides that funds should be apportioned among the states in the proportion which their population, area, number of registered civil aircraft (other than those owned by scheduled air carriers) per civil airport bear to the total population, area and number of civil aircraft of all the states per civil airport.

In order to bring about the establishment of a nationwide system of public airports adequate to meet the present and future needs of civil aeronautics, the bill directs preparation of a national airport plan and authorizes the appropriation of \$100,000,000 for the fiscal year ending June 30, 1945, and \$100,000,000 for each of the nine successive fiscal years. States would be required to match Federal contributions on a 50-50 basis thus making a total program of \$2,000,000,000. Special provision is made that not more than 2 per cent of any annual appropriation can be expended for the development of any one airport.

WPB Approves \$2,000,000 Indiana Construction

Samuel C. Hadden, chairman of Indiana highway commission, on June 27 reported WPB approval on additional emergency road construction totaling \$2,153,000. Largest project is 10.75 miles of 22-ft. concrete on U. S. 40, Dublin-Dunreith, to supplement 1922-paved strip now badly deteriorated.

EVER NOTICE THE DIFFERENCE AFTER A RAIN?



STOP Dust and Silt with a FLUSHER

Germ laden dust and silt blowing off the streets into homes, schools, stores, hospitals and churches present a serious problem in Municipal health and sanitation. *Keep the air and the streets fresh and clean with a Flusher.*

The STANDARD STEEL Model 5 Flusher has a big 500 GPM pump capable of handling three nozzles at 50 pounds pressure with a cleansing width of 42'—one trip down the block thoroughly cleans.

Built of High Tensile Steel throughout, the Model 5 is four to six times less subject to corrosion than ordinary flushers. At the same time this modern Streamlined Model 5 costs no more than old fashioned round types.

Other pump sizes available up to 650 GPM.

Write today for Catalog.

Also a complete line of Tractor Powered Flushers for flushing or sprinkling.



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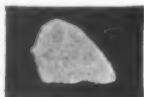
Asphalt Distributors
Tar Kettles • Maintenance Distributors
Burners • Spray Units
Supply Tanks • Street
Flushers • Surface
Heaters • Shoulder
Rollers

From Subsoil to Surface

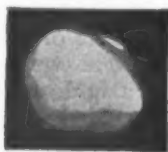
PUT CALCIUM CHLORIDE TO WORK IN YOUR PROJECTIVE MAINTENANCE

Mighty Moisture Magnet

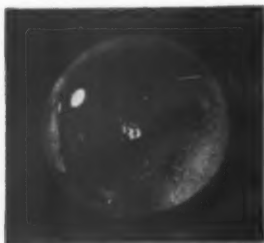
The moisture absorbing action of calcium chloride is a powerful natural force, easier to show than explain. The following picture shows how calcium chloride dissolves itself in the moisture it attracts.



This picture shows a flake of calcium chloride about twice its natural size, just as it comes out of the bag—dry, easy to spread on the surface of the road.



The same flake 24 minutes after exposure to the air at a normal summer temperature of 77° and a relative humidity (moisture content of the air) of 78%. At this temperature and humidity, a pound of flake calcium chloride will take up about 2¾ lbs. of water.



The same flake 180 minutes (three hours) after exposure to same air conditions, having completely dissolved itself in the moisture it attracted. This absorbed moisture has high evaporation resistance and non-freeze properties.

CORRECT SUBGRADE FAULTS

By eliminating frost boils and preventing detrimental heaving. Research and field work show that effective and economical results are obtained by impregnating subgrade soils with calcium chloride.

STRENGTHEN WEAK BASE COURSES

By substantial patching and extended addition of well-graded soil-aggregates, when and where necessary. Calcium chloride will: (1) Permit cutting the binder-soil fraction to a minimum, (2) accelerate compaction and (3) preserve the stability.

CONSOLIDATE LOOSE GRAVEL SURFACES

By correction of the soil-aggregate composition and calcium chloride treatment. The evaporation-resistant moisture binds the surface materials together to preserve stability and prevent gravel loss.

STABILIZE PAVEMENT SHOULDERS

By shouldering with well-graded soil-aggregates, stabilized with calcium chloride. This will provide substantial foundation for traffic turnout and base for future seal-coating.

EXPEDITE CONCRETE PAVEMENT PATCHING

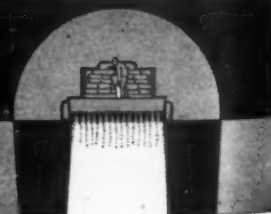
By using calcium chloride in the mix. Pavements can be opened to traffic in 24 hours because calcium chloride gives early strength and "built-in curing."

New Literature Explains Methods

A series of technical and practical working bulletins explain methods of construction and maintenance. Write for Bulletin No. 31, "Projective Maintenance" which includes a list of Bulletins available. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.

CALCIUM CHLORIDE

FOR BETTERMENT IN ROAD MAINTENANCE



Editorial

THE Ohio state department of highways is doing a mighty fine job of maintenance, considering the fact that it is getting along with about half the normal number of workers this summer.

Much credit is due the department's emphasis on two points.

One is planning ahead. County road superintendents are encouraged and taught to plan work well ahead. It's not a thing you can teach by rule, always, but rather a matter of picking men who can develop the knack of keeping an eye on next month's and next season's needs today and being ready for them. When you have a good planner you have a good superintendent.

The other thing is instruction. Road foremen (they're called laborers-in-charge in Ohio) are taught to "think with their materials." Through demonstrations, movies, the annual foremen schools and in day-to-day supervision they are shown not only how to make a road patch but why that's the best way.

SERIOUSNESS OF LAG IN POSTWAR PREPARATION

THE necessity of engaging in real and bold preparedness for peace is becoming increasingly apparent, as victories pile up on all war fronts.

We're far from being well prepared today. Few steps have been taken which establish definite postwar programs, reminds Charles M. Upham in an ARBA release. The point is rapidly being reached where tangible action can be taken.

Far more depends on Congress than most people realize. Federal legislation established to create the gigantic machinery of war must be unwound and fitted to peacetime activities and to the re-establishment of private enterprise. All industries are dependent in large degree upon decisions made by Congress, particularly decisions relating to termination of war contracts, disposal of surplus war equipment, release from war restrictions, taxation, and Federal participation in postwar public works.

Faced with war problems, Congress has been unable to take final action on many postwar problems. However, through hearings, it has become informed on many subjects which will permit of fast action after disposing of war legislation.

Highway construction, one of the most essential activities, constitutes a problem of the highest order. Here is a compelling chain of circumstances:

1. After the war it is likely there will be far more jobseekers than jobs—9,000,000 some say.

2. There is an over-optimistic feeling right now that the prosperity generated by the war will of its own accord continue after the war. Dare we to depend on this? Remember, it was the war which ended the last depression.

3. The war may end sooner than we think.

4. Housing construction, normally a big economic factor, is a question mark. Latest surveys show only half the volume some have anticipated.

5. There will be an unparalleled demand for motor vehicles. General Motors is planning a \$300,000,000 retooling program, others have similar huge production plans. Business will require greatly increased usage of the motor vehicle, both in commercial hauling and in passenger movement.

6. Probably no need of the nation is more widespread or urgent than its highway needs. Before the war, roads and streets were wearing out faster than they were being built. Wartime construction has virtually stopped and maintenance necessarily has been dangerously neglected. Surveys of construction urgently needed now: main state highways (including F. A. system) \$7,000,000,000; metropolitan roads and streets, \$5,000,000,000; county and local roads, \$4,000,000,000. Total, 16 billion dollars worth of useful and needed work waiting to be done the first few years after the war.

7. Economic history shows that to have prosperity and anything like full employment, large-scale production of *durable goods* is necessary, but that production must be balanced. Durable goods production is basic—the activity that starts the chain of processes.

8. During the last depression it was in construction men who first began losing jobs in large numbers. By 1932, 60 per cent of construction workers were jobless, millions of others in allied service industries likewise as a consequence.

Remind your Washington servants that postwar highway construction should account for fully *three billion dollars a year*, in order to meet actual highway needs and to round out the total construction demanded to meet the nation's economic needs.

Meanwhile, do everything humanly possible to get more construction plans ready. While over a billion in road, street and bridge projects are now in the design stage, a few states account for the bulk of the progress. Others are lagging. The postwar challenge will require the concentrated and cooperative efforts of Federal, state, county, city and local governments.

When
**ALL ROADS
LEAD TO
HOME**



**DIETZ
LANTERNS**

**DIETZ
TORCHES**

An estimated expenditure of \$3,000,000,000 a year, for the first FIVE post war years, will be required for repairing, extension, construction of American highways.

The long burning, ever reliable DIETZ LANTERNS will be called upon to play an important part in supplying proper light and safety.



R.E. DIETZ COMPANY
1840 NEW YORK 1944
*Output Distributed Through the
Jobbing Trade Exclusively.*

ROADS AND STREETS, July, 1944

Fort Worth Flushes Downtown Sidewalks



The vertical post on the front of this sprinkler truck has a bracket at the top over which the hose is passed to keep it clear of parked cars when flushing downtown sidewalks. Note pressure pump in motor mounted in front on this outfit, which is a general purpose truck converted for light duty sprinkling work

By H. H. HESTER

Street Supt., City of Fort Worth, Texas

FORT WORTH'S night cleaning crews in ordinary times begin on downtown streets about midnight after traffic and parking have thinned out. But in these war-booming days people flock through the business district all night long and in such numbers that sweeper and flusher work has been seriously hampered.

The best solution to this problem to date has been to do some hand cleaning through the week, but to depend mainly on a 24-hour weekly cleaning routine which begins about 8 a. m. Saturday. On Saturday morning a day crew gets going with hand brooms. About midnight Saturday "can" men and trucks come along and usually cover the 70 blocks of the downtown area by 8 a. m. Sunday. Especially popular with downtown business people is the summertime practice of hosing down all walks every few nights. Dust and filth of course accumulate gradually along any street, and some Ft. Worth pedestrians consider it their good old American privilege to throw waste paper wherever they want, in spite of efforts to teach them to use the neatly painted black-and-white refuse boxes provided along the curbs.

The sidewalk cleaning crew is a "blitz" outfit consisting of two men on a 650 gallon truck. The truck is equipped with a gasoline driven pump and pressure hose, which is carried over a vertical post mounted on the front of the truck so that the hose can conveniently clear parking meters and swing over parked cars. Dirt is cut into the street, where the street flusher takes it into the inlets. An inlet

flusher is available in emergency but is seldom needed.

The walk crew moves fast, the hose truck traveling continuously. The entire business district of 65-70 blocks is covered in three nights. Only a light stream of water at good pressure is needed for walk cleaning.

W. O. Jones is Director of Public Works.

New Officers A.S.T.M. for 1944-5

Official notice of the election of the following officers of the American Society for Testing Material was given on June 28 at the 47th annual meeting of the society:

President (term one year), P. H. Bates, Chief, Clay and Silicate Products Division, National Bureau of Standards, Washington, D. C.

Vice President (term two years), Arthur W. Carpenter, Manager, Testing Laboratories, The B. F. Goodrich Co., Akron, O.

Members Executive Committee (term two years), W. C. Hanna, Chief Chemist and Chemical Engineer, California Portland Cement Co., Colton, Calif.; L. B. Jones, Engineer of Tests, Test Department, The Pennsylvania Railroad Co., Altoona, Pa.; J. T. MacKenzie, Chief Metallurgist, American Cast Iron Pipe Co., Birmingham, Ala.; J. G. Morrow, Chief Metallurgist, The Steel Company of Canada, Ltd., Hamilton, Canada; Sam Tour, President Sam Tour and Co., Inc., New York, N. Y.

Contractors Guide Simplifies Termination of Contracts

Major questions confronting war contractors are answered in a new booklet for both prime and subcontractors, "The Contractors Guide." Written in nontechnical language and graphically illustrated to emphasize salient points, the booklet is another step in the program of the Readjustment Division, Army Service Forces, to simplify action and promote speedier settlements of terminated contracts.

Written for contractors holding fixed price supply contracts with the War Department, the publication sets forth the chronological actions in a termination settlement. The Guide emphasizes preparation for termination by listing steps the contractor may take before any of his contracts have been terminated.

Based on the Army's procedures in Procurement Regulation No. 15, the booklet has three main sections. The first gives the ABC of terminations. The second suggests things the contractor can do in his shop, with the Government, and with his suppliers and subcontractors. The last contains facsimiles of the new uniform termination forms.

Copies of the Guide can be obtained from War Department procurement offices throughout the country.

8,445 Miles of New Highways Built in 1943; All Essential to the War

During 1943, 8,445 miles of highways of all classes were completed in the United States under PRA supervision. This compared with 10,178 miles in the preceding year, with 12,936 miles in the 1941 fiscal year.

Highways completed consisted of 4,148 miles on the Federal-aid system, 1,056 miles of secondary Federal-aid roads, 106 miles in the elimination of railroad grade crossings, 2,836 miles of access roads to war industries and military and naval establishments, 168 miles of national forest roads, and 131 miles of miscellaneous construction.

One hundred and eighty-seven highway-railroad grade crossings were eliminated, 34 obsolete structures were reconstructed, and 196 crossings were protected by signals and other devices.

The total cost of all completed work was \$274,801,799, of which the Federal Government paid \$196,600,272, or 72 per cent.

Approvals of new projects fell to the lowest level in many years, amounting to 5,861 miles. This mileage was composed of 4,753 of access

roads to war industries and military and naval establishments, and the remaining 1,108 miles, although financed with Federal-aid and miscellaneous funds, was all certified by war agencies as essential to the conduct of the war.

Marion County (Indianapolis), Indiana, is putting bridge repairs and replacements first on its list of tasks to be done "from here on out." Aside from a post-war program of new modern bridges, which include three

large multiple-span concrete arch structures, construction plans are well advanced or ready on a great many swollen waterways down to 10 ft. span.

More immediately, this county has upward of a million dollars of repair work that could well be done on abutments and superstructures of existing bridges, some of which are very old, according to County Surveyor, Paul Brown and County Highway Supervisor, Robert R. Fischer.



Engineered to Keep CONSTRUCTION MACHINERY on the Job

Vital construction and maintenance jobs won't click with schedules if graders, bulldozers or trucks break down. Keep every piece of equipment fit for full time and overtime by using the best maintenance motor oil you can get—AMALIE Pennsylvania Motor Oil—the oil that stands up better because by actual test it's 20% OILIER! See your AMALIE Distributor, or write Dept. R-3.

Get your copy of the AMALIE Lubrication Data Manual, the 48-page illustrated booklet that gives you practical lubrication help on all types of construction machinery.

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Equipment Maintenance

How to Prevent Truck Tire Failures

Double your tire vigil! This summer is probably the most critical period of all in our nation's rubber time clock. Here is a timely discussion of failures and preventive measures

WHILE synthetic rubber production has yet to reach its ultimate production goal, stockpiles of native rubber are dwindling toward zero. The heart of the crisis is truck tires, which develop such high heat in service that synthetic truck tire development has yet to meet with full success.

Highway and Street Departments and contractors must therefore maintain an ever more watchful and grim routine of preventive maintenance and repair. We are indebted to the B. F. Goodrich Company of Akron, Ohio, for the following hints and photographs, taken with permission from their recent publication, "How to Prevent Truck Tire Failures." (Copy obtainable on request to Akron).

An Ounce of Prevention . . . Worth a Pound of Cure

Most tire injuries can be avoided by using simple care. In this book are pictures of the most common types of tire failures, descriptions of how the failures occurred and easy ways to avoid them.

These are pictures of failures in the very best crude rubber tires. With synthetic rubber tires the remedies

suggested are many times more important.

Do not overload synthetic tires. Be extra careful to use proper air pressure. Drive slowly. Avoid every possible cause of tire injury!

These eight factors cause most truck tire failures: Overloading, Improper inflation, Excessive speed, Impacts, Mechanical irregularities, Improper matching of duals, Cuts, Punctures.

A study of accompanying pictures of the tire failures will help you to understand the causes of early truck tire failures. In each case suggested remedies are given.

What Happens When Overinflation, Overload and Impact Get Together

Fig. 1 shows the inside of a truck tire that has failed from an impact break. However, notice the failure along the shoulder. This indicates that the tire was breaking down directly under the edge of the tread before the impact took place. This breaking down under the edge of the tread is what tire men call a "fatigue break". But call it what you will, it is a ruined tire—ruined finally by an impact. Overload caused the impact

to be much more severe; and overinflation stretched the cords so tightly that, instead of the tire flexing to take up the blow as it would have if it had the proper pressure, it opposed the blow and the cords broke.

To Correct Situation: (1) Use recommended load and air pressure for the particular size tire; (2) Drive carefully to avoid severe shock to tires.

When a Fast Moving Tire Meets an Immovable Object

Case No. A

Fig. 2 shows the outside of a tire which has failed from a tread bruise or impact break. Indications are the tire was not overinflated, because usually an impact break in an overinflated tire will result in more of the tread being blown loose. Bruise breaks—caused by a tire receiving a severe shock from having struck some object—is one of the most common causes of truck tire failure. Most failures from this cause can be avoided by careful driving—especially if overloads are eliminated.

Case No. B

Fig. 3 shows another tire with a definite bruise break. The tread has been cut away to show what goes on under the tread after the tire receives a severe shock. Inside the casing the injury shows up as a criss-cross impact break. The injury pinched the tube, allowing the air to seep up between the plies. The resulting separation permitted severe friction to occur between the plies, melting the rubber and chafing the cords.

To Prevent: (1) Drive slowly on rough streets and roads; (2) Avoid deep "craters" in pavement; (3) See a rock? Go around; (4) Never run a tire over a curb.

How a Little Tread Bruise Can Grow Into a Big Tire Blowout

In Fig. 4 you see a definite criss-cross bruise or impact break that ended up in a first-class blow-out. In-

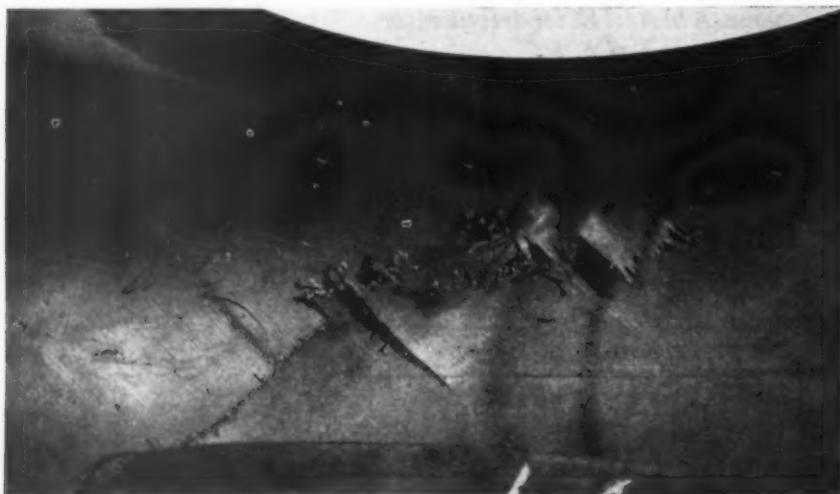


Fig. 1

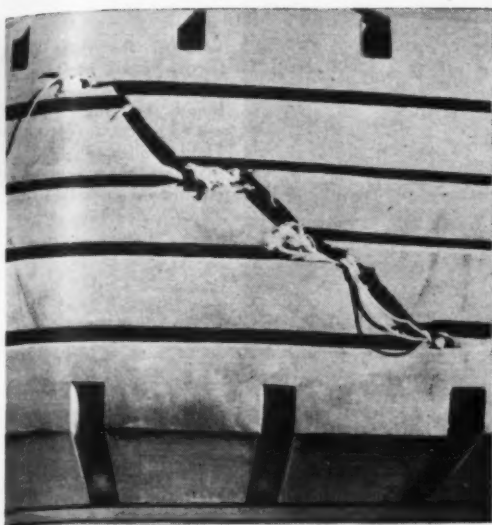


Fig. 2



Fig. 3



Fig. 4



Fig. 5

indications are the bruise break was small when it originally occurred, but it was sufficient to pinch the tube and allow the air to seep into the cord body. The break continued to enlarge and the tread blew off when the blow-out occurred.

Fig. 5, outside view, shows evidence that the tread and plies became loose after the tire was bruised, resulting in a chafing condition. Practically all of the severe chafing occurred within a limited area around the center of the break and at its edges.

Remedy Is Simple: (1) *Have tires inspected often;* (2) *Have small bruises or cuts repaired immediately by a reliable tire repair man . . . chances are a blow-out will be warded off and the tire will have a chance to live out its normal life.*

What Too Much Heat Can Do to a New Truck Tire

In Fig. 6 is a good example of the explosive force of compressed air. Notice how the blow-out has blown the almost new tread loose. The thicker the tread the greater the like-

lihood of high temperature. This blow-out occurs when tires get hot from overload or speed, or a combination of the two. Increased heat causes increased air pressure. In this case, overinflation finished what heat began.

"Bleeding" the tire to offset built-up pressure does not relieve the situation. It only increases flexing, which produces more heat and hastens failure.

Problem Can Be Solved: (1) *Adjust the load to the tire—Do NOT try to*

adjust the tire to the load by increasing the air pressure; (2) *Do not exceed speed recommended for your particular tire and load conditions;* (3) *Do not "bleed" tires! Regulate tire heat by controlling load and speed;* (4) *"Break-in" new tires on front wheels where loads are not so heavy.*

Additional illustrations showing types of truck tire failures and how to prevent them will be published in a subsequent issue.

ROADS AND STREETS, July, 1944

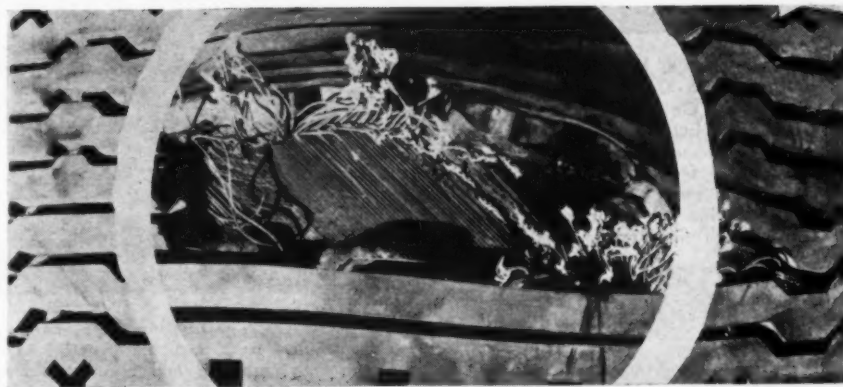
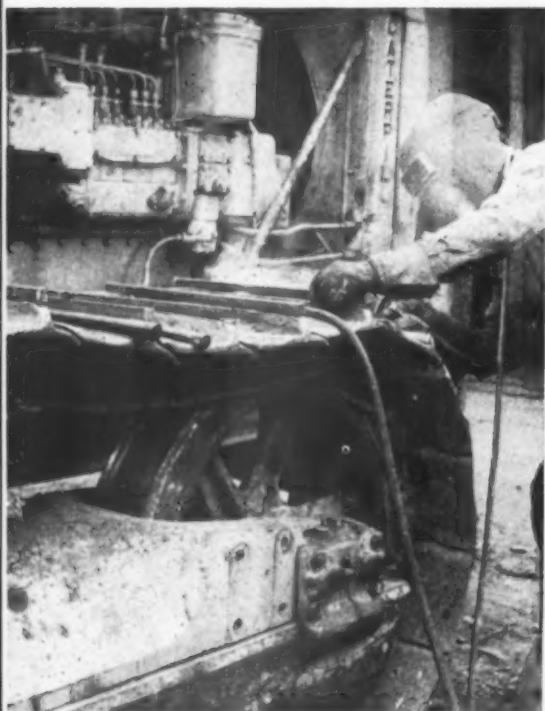


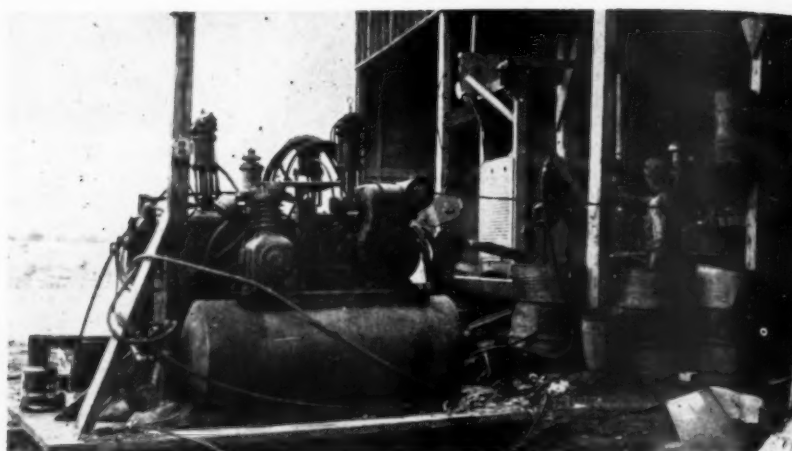
Fig. 6



One of the three field shops. Kiewit, McDougald and Western, who combined on the grading contract, at Hensley Field, Dallas, decided to maintain their respective equipment with their own facilities



(Below): Very large, high-unit-pressure sheepsfoot rollers built by a Dallas firm were employed at Hensley Field. On completion of the job their worn feet were burned off and new heavier feet, made in a local shop, were welded on. The welder first tacked the feet on with a mild steel all-purpose rod, then went over the stringer bead with second pass using a type of rod selected to build up a high fillet rather than penetrate



McDougald's men are spray-painting a tractor just overhauled. Pressure comes from a small compressor carried on skid-mounted field repair and servicing outfit

(Left): Building up worn grouser cleats with filler bars in the Kiewit shop



Western Construction Corp. had a welding outfit going night and day. Their welders were particularly proud of this row of dipper teeth, built up with new manganese tips and hardfaced over all with beads running parallel and criss-cross as shown

After equipment was overhauled it was steam cleaned by a subcontractor who had several pressure outfits, operated in some instances from trucks as shown



Safety Rules for Garage and Shop

JUST as a matter of cold economics, it's worth many dollars to any contractor or road organization to see that accidents *don't* happen.

With the slogan "Keep Your Mind on Your Job!" the Ohio department of highways, bureau of maintenance, has issued a safety code for employees. It contains the following practical rules for shop and garage work and use of tools.

1. All employees must familiarize themselves with the various safety and protection devices in highway shops and garages.
2. First Aid Kits must be conveniently placed and kept filled with necessary materials.
3. Use only extension cords and sockets that are in good condition.
4. Do not allow gasoline to stand in open containers.
5. Do not wear oil soaked clothing.
6. Do not place oily rags in bench drawers or cabinets.
7. Keep floor clean. Never allow grease or oil to remain on floor.
8. Keep tools sharp and in repair. Avoid split-headed chisels and defective tools of all kinds.
9. Never use a grinding wheel that is loose on the shaft or out of balance.
10. Use all safety devices provided for protection of life and limb.
11. Do not depend on jacks or chain hoists alone to support a vehicle, use blocks or horses to support it in place. Make sure lifting jacks are wheel-centered before making the lift. Remove the handle of a mechanical jack when under load.
12. Do not inhale mist from paint spray gun—use mask.
13. Do not smoke near the spray room.
14. Motors must be stopped when gasoline tank is being filled.
15. In welding or soldering, tanks or containers which previously contained gasoline must be steamed two hours or more before working on them, or they must be filled with water while work is being done.

Equipment Care an Important Part of the Hustle and Hurry at Hensley Field, Texas

See opposite page for photos taken by **ROADS AND STREETS** editor in connection with the article on this airport, page 66.

16. Keep garages, yards and other places about you clean. Surplus material should be piled, staked or placed in a good housekeeping manner so that it does not present a hazard.

17. Tar on the hands should be removed immediately. Touching or rubbing eyes will cause serious injury.

18. When cranking equipment, employees must use extreme caution to prevent breaking thumb or arm in case of backfire.

19. Always use goggles while grinding or performing other operations where there is likelihood of flying particles.

20. Keep tools sharp and in repair.

21. Carry single edged axe with handle on shoulder, the head back of, and close to shoulder with blade turned out and with hand near the end of the handle.

22. Mauls must be left tight and securely wedged to smooth, straight

(Continued on page 98)



Ingersoll-Rand
Comes to "Close Quarters"
with the aid of



RBC

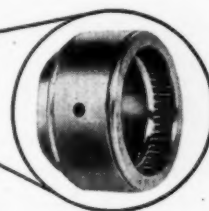
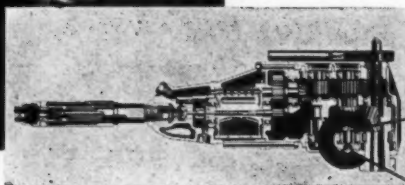
NEEDLE BEARINGS

Ingersoll-Rand Close-Quarter Drills are exceptionally powerful machines, in which all rotating parts are supported by anti-friction bearings. Among these, an important part of the load is borne by RBC precision Needle Bearings.

The "Multi-Vane" Close-Quarter Drill shown here is equipped with RBC 20th CENTURY Bearings, designed as a self-contained unit, incorporating a full complement of small diameter rollers in a hardened and ground outer race. This application makes use of a solid hardened and ground inner race.

Much of the reputation for low maintenance cost enjoyed by these "Multi-Vane" Drills is due to these precision anti-friction bearings designed for minimum overall dimensions and maximum carrying capacity.

Showing Location of RBC 20th CENTURY Bearings in "Multi-Vane" Close-Quarter Drill



There's an RBC Bearing in This Picture, Too!

Even though they are out of sight, the RBC 20th CENTURY Needle Bearings located at strategic points within this "Multi-Vane" flue rolling machine are doing a most important job, insuring smooth and continuous operation of rotating parts. Actual use demonstrates that these bearings may be operated advantageously at high speed ranges. Perhaps YOUR equipment would benefit through use of RBC BEARINGS. Our engineers are ready to assist you.



ROLLER BEARING CO. of AMERICA
TRENTON . . . NEW JERSEY



When was it repaired? Who did it? What was done? This handy card file holds the history of each unit in Atlanta's equipment fleet

Handy Job Cards Expedite Atlanta Municipal Shop Work

ATLANTA'S municipal garage and equipment shop, under the Department of Motor Transport, takes care of 325 city owned trucks and autos and about 100 pieces of miscellaneous construction and street repairing equipment, as well as major repairing at the city's five disposal plants.

"Not one truck down for lack of parts or manpower" has been the proud statement of Superintendent R. B. Jett. By doing a lot of scratching he has been able to maintain an almost full crew, consisting of 2 foremen, 11 auto mechanics, 3 machinists, 3 blacksmiths, one welder, a night man for greasing, and several helpers.

Superintendent Jett has been able to keep on top of the wartime repair problems thanks to several factors:

1. A strict preventive maintenance routine, adhered to rigidly in normal times, is kept up as well as possible. A lot of mechanical trouble has been caught before it could happen.

2. Equipment has lasted longer and with less repair than usual because of special care in purchasing. Mr. Jett writes specifications for equipment to be purchased by the construction, police, fire and other departments trying to select or design it with its particular use in mind. For example, for every truck purchased, the body type, wheel base, load capacity, gear ratio best for Atlanta's hills, etc., are specified for the intended use; then tires, drive shaft, and other details down to accessories are specified in detail. This practice over the years is paying dividends now.

3. Shop men are trained to a special consciousness toward

manufacturers' service recommendations. For every piece of equipment a shop or service manual is obtained, if available, and that manual kept on file in a shop cabinet reserved for such manuals. These are used. Well gotten-up manuals—with plenty of drawings and explanatory pictures—are about the best thing an equipment maker can put out, thinks Mr. Jett. Next, of course, to a good machine to begin with. He regards them "as valuable as our tools."

Manuals are filed alphabetically under 50 or 60 classifications such as Blowers, Boilers, Cranes, Carburetors, Drills, Motors (by make), etc.

Manuals are sources of often overlooked but extremely valuable data such as gas tank capacity, recommended tire pressures, etc. Service men can "look in the book" for many answers.

4. Of special interest is the job card file worked out by Supt. Jett. In a handy "pull-out tray" cabinet, he keeps a card for each auto or other mechanical unit, on which entry lines are given for the following items:

Make	Transmission
Model	Drive Shaft
Motor No.	Universal Joints
Serial No.	Rear Axle
Switch Key No.	Brakes
Bought From	Generator
Date of Delivery	Starter
Kind of Motor	Distributor
Bore	Carburetor
No. of Cylinders	Steering Gear
Foot LBS Torque	Fuel Pump
Wheel Base	Gasoline Tank

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5 lbs. 1/4x18"

10 lbs. 3/16x18"

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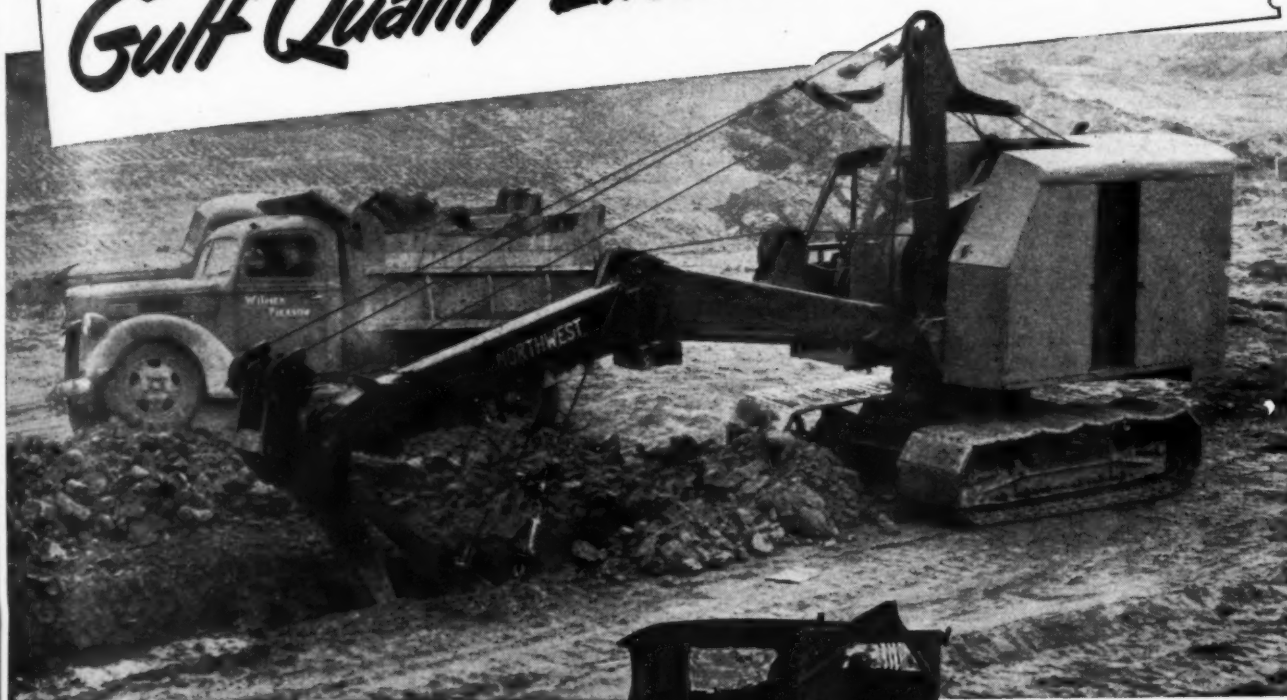
COLUMBIA BROADCASTING SYSTEM

Basic Pacific Network

Better all-round job efficiency—Lower maintenance costs

with

Gulf Quality Lubricants & Fuels!



★ Wilmer Pierson has a \$1,000,000 earth-moving contract on the Industrial Express Highway project near Detroit, Michigan. This will be an elevated highway running from the Ford plant in Dearborn to the Willow Run bomber plant at Ypsilanti. The Pierson part of the job is well ahead of schedule.

"Right from the start of this job we have steered clear of mechanical troubles and obtained top performance from our equipment by using Gulf lubricants and fuels," says the contractor on this highway project.★ "Our experience with Gulf products adds up to better all-round job efficiency and lower maintenance costs."

Leading contractors on all types of earth-moving jobs depend on Gulf quality lubricants and fuels to help them beat contract schedules. For they know that proper lubrication and efficient fuel performance result in fewer delays from mechanical troubles, longer service life for equipment, and less expense for maintenance.

Call in a Gulf Service Engineer today and ask him to check over your equipment. He will recommend lubricants and fuels best suited to your particular equipment and operating conditions.

The services of a Gulf Engineer—and the Gulf line of more than 400 quality products—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office.



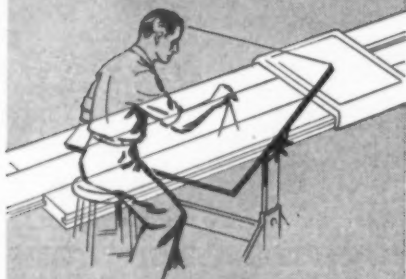
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GULF REFINING COMPANY**

GULF BUILDING, PITTSBURGH 30, PA.

ROADS AND STREETS, July, 1944

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ENGINEERED TO THE JOB



TO ELIMINATE
PREMATURE
ENGINE WEAR

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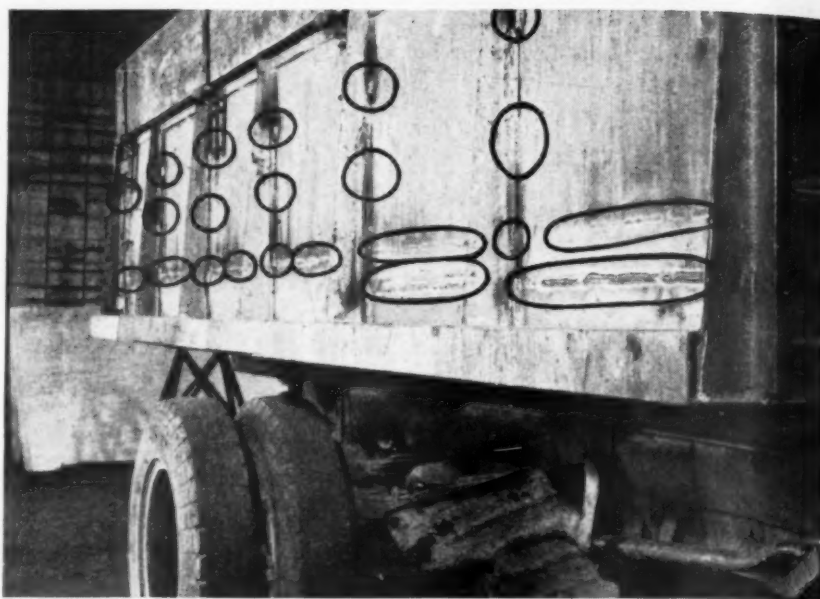


The free WGB book explains oil-clarifying, illustrates various WGB models for gas and Diesel engines. Send for it.

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OIL CLARIFIER, INC.
KINGSTON, N. Y.

LET'S KEEP SEDIMENT
OUT OF LUBRICATION

ROADS AND STREETS, July, 1944



Welders "go over everything," finding ways to strengthen or armor equipment against wear and deterioration. The circles mark spotwelds made all over this truck body to tighten it up for further duty

Gear Ratio
Wheels
Size of Tires
Clutch

Oil Capacity
Radiator Capacity
Hoist
Body
Gross Weight

A separate service record is kept on brake and clutch linings, which are a source of constant complaints in some fleet-owner organizations. This record helps decide on probable service needs, and also nails down responsibility. For example, if a driver comes in after 8,000 miles of driving on a set of linings, the card will show this mileage and indicate therefore that probably readjustment is all that is needed. Should the brake be badly worn, at this mileage, the driver assigned to the vehicle will have some fast explaining to do.

Valuable also in case of disputes is the card space for recording when work was done on gas tank and radiator repairs, what it consisted of, and who did it (whether the repairs were farmed out or performed by a shop mechanic).

5. Finally, the Atlanta shop men have kept all equipment "on its feet" by salvaging or making anything needed to avoid a long wait on factory parts. To show the extent of this policy, even the city's tin garbage collection tubs have been renovated with acetylene torch and pieces of scrap metal, one welder putting in nearly full time on this special chore.

Safety Rules

(Continued from page 95)

grained handles, and properly balanced. Striking faces should not be battered and must be free from all checks and fissures or cracks.

23. Chisels should be tight on the handle, ground with a sharp, rounded edge, with no mush-room or overhang on the head, and free from cracks or checks. When using bull chisels, employes should never hold them with their hands. They should always use tongs and should stand at right angles to the direction of the blow.

24. No axe, maul, hammer or other tool shall be used in which the head is not firmly fastened to the handle.

25. Picks should be tight on the handles and must be free from cracks or splits. Wear goggles if material is hard or when digging in frozen ground.

26. Shovel handles, sockets and rivets should be smooth. Shovels should never be used as a pry or left where men are likely to fall over them.

27. Make sure lifting jacks are wheel-centered before making the lift.

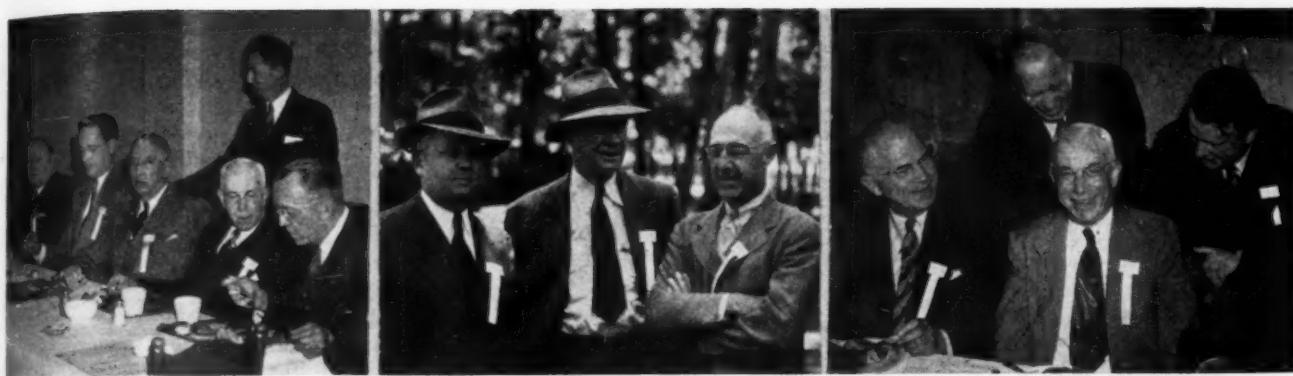
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Photos Courtesy Michigan Contractor and Builder.

(Left to right): Dr. Wm. J. Hale, Dow Chemical Co.; Hon. John B. Bennett, Congressman 12th Dist.; A. E. Petermann, pres. C. & H. Consolidated C. Co.; Chas. M. Ziegler, state hy. comm.; W. H. Schacht, Houghton County road comm.; N. H. Manderfield (standing), prof. metallurgy, M.C.M. & Tech.; M. L. Council, Petoskey Cement Co.; Dr. Louis Webber, Co. Road Ass'n of Mich.; B. R. Downey, maint. engr., Michigan state hy. dept.; Dr. G. C. Dillman, pres., Mich. Col. of Mines and Technology; W. C. Veale, Keweenaw County road comm.; Chas. M. Ziegler, Mich. State hy. comm.; C. F. Winkler, Houghton County road comm.

Upper Peninsula Road Builders Hold Successful Meeting

Over 200 attended the 1944 annual conference of the Upper Peninsula Road Builders Association, Houghton, Michigan, June 8-9. County men on the program included J. T. Sharpsteen, engineer-manager, Delta County road comm., Escanaba; T. S. Dundon, outgoing Assn. president and eng.-mgr., Luce County; and G. T. Murphy, chairman, Houghton County commission. Michigan highway commissioner Charles M. Ziegler unveiled a list of postwar road projects for the north region.

George L. Depew, engineer, Alger County road commission, was elected Assn. president; C. L. Morley, Ontonagon County, vice pres.; W. A. Gray, Marquette County, secy.-treas.

Officials AASHO Meet in Chicago

The Executive Committee of the American Association of State Highway Officials held its mid-year meet-



H. C. Coons, Mich., deputy state hy. comm.; Harry T. Ward, chief deputy comm.; D. J. Vairo, Sinz Machinery Co.; W. W. Lavers, Inland Steel Corp.; W. L. Kaiser, Houghton County road comm.; Harold J. McKeever, Editor, "Roads and Streets"; L. P. Scott, sr. hy. engr., PRA; A. M. Davis, Portland Cement Ass'n

ing at the Palmer House in Chicago on June 22 and 23. The meeting was for the consideration of routine business. The date and location for the 1944 annual meeting of the association was decided upon. The meeting will be held in Cincinnati, O., Nov. 27 through Nov. 30. The headquarters will be the Netherland Plaza.

A considerable portion of the business meeting was devoted to a discussion of the legislative situation as it relates to the post-war highway

program. H. R. 4915, successor to H. R. 2426, was reported out of the Roads Committee of the House recently by unanimous vote. The bill is scheduled to come up for consideration immediately after Congress reconvenes in the late summer.

Members of the Executive Committee had opportunity at this meeting to discuss in considerable detail the important matter of disposal of surplus road construction machinery following the close of the war.



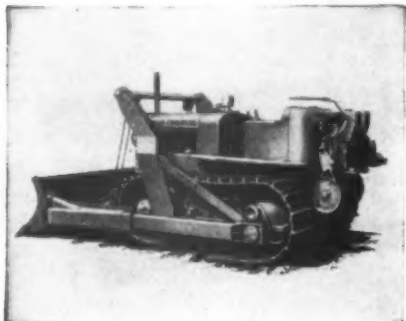
Executive Committee, American Association of State Highway Officials, at its mid-year meeting at Chicago. Left to right: First V.P. Herman A. MacDonald, Mass.; Exec. Comm. Member M. J. Hoffmann, Minn.; Exec. Comm. Member H. E. Sargent, Vt.; Exec. Comm. Member F. E. Everett, N. H.; Regional V.P. Burwell Bantz, Wash.; Exec. Comm. Member J. S. Williamson, S. C.; Exec. Comm. Member Brady Gentry, Tex. (past pres.); Exec. Comm. Member Carl

W. Brown, Mo.; President Samuel C. Hadden, Ind.; Exec. Comm. Member R. H. Baldock, Ore.; Exec. Sec. Hal H. Hale, Washington, D. C.; Reg. V.P. C. W. Phillips, Tenn.; Exec. Comm. Member T. H. Cutler, Ky.; Reg. V.P. H. G. Sours, Ohio; Reg. V.P. Ezra B. Whitman, Md.; Treas. George H. Henderson, R.I.; Exec. Comm. Member Thos. H. MacDonald, P.R.A.

New Equipment and Materials

New Double Trunnion Tilt Dozer for HD-7

A new cable-controlled side-lift bulldozer and trailbuilder featuring single kingpin mounting of the moldboard and double trunnion tilting has been announced by The Buckeye Traction Ditcher Co., Findlay, O. The moldboard of the trailbuilder can easily be angled to the right or left on the single kingpin simply by removing two landside pins, swinging the blade to the desired side, and replacing the landside pins which hold it rigidly in place. The double trunnion mounting makes it possible to tilt either end of the blade 12 in. by



New Buckeye tilt dozer

attaching one push arm to the top trunnion on one side while the other arm is mounted on the lower trunnion on the opposite side. The horn and push frames which have been completely redesigned are fabricated from heavy steel welded boxbeams to provide maximum strength. The rugged construction of the moldboard is another of the exceptional features of the new dozer. Welded v-shaped vertical braces and heavy steel plate horizontal cross pieces reinforce the blade so that it can withstand the toughest bulldozing operation. Moldboard is fitted with reversible cutting edge and replaceable corner bits. The new dozer is track mounted with the weight evenly distributed over the crawler shoes to provide maximum traction. Single or double drum Buckeye power control units provide the necessary power.

New Revolving Field Generators

A new generator has been added to the line of the Kato Engineering Co., Mankato, Minn. These Kato-light revolving field generators are built in sizes 5, 10, 15 and 25 K.W.,



10 K.W., 110-Volt A.C. revolving field generator

4 pole (1800 r.p.m.) and in sizes 5, 10 and 15 K.W., 6 pole (1200 r.p.m.). They can be furnished as independent two bearing generators suitable for belt or coupling drive or as single bearing generators designed to fit standard SAE engine bell housing. These generators are conservatively rated and will carry 25 per cent overload without exceeding allowable temperature rise. Voltage regulation is approximately 10 per cent with 2 cycle speed change.

New Mobile Crane

A new $\frac{3}{4}$ -yd. machine has been added to the line of the Universal Unit Machinery Corporation, Milwaukee 1, Wis. This unit 1020 is mounted on a 3-axle undercarriage, providing a complete unit which is one man operated. From the operator's position in the cab he controls not only the functions of crane operation, but also the traveling of the undercarriage. Travel brakes are operated by means of air, while the steering is by means of hydraulics. The lifting capacity of this Unit 1020 mobile crane considerably exceeds

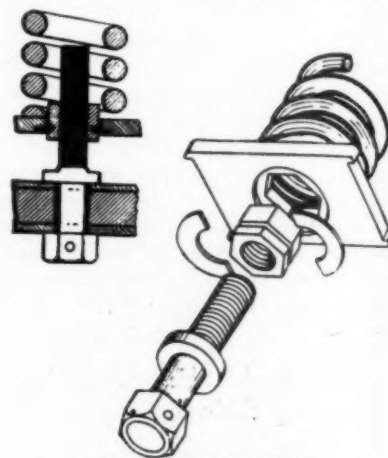


New Unit 1020 $\frac{3}{4}$ Yd. Crane

that of a Unit 1020 crawler crane, and yet it is stated to be far easier to maneuver, and to attain greater speeds than the crawler mounted machine. It is equipped with a four speed transmission, giving a range of speeds from slightly less than one mile per hour up to eight miles per hour. The machine as a crawler crane is rated at the 10-ton capacity, but the greater width and weight of the rubber tired understructure considerably increases this capacity, even without the use of outriggers.

Emergency Shear Plates for Crushers

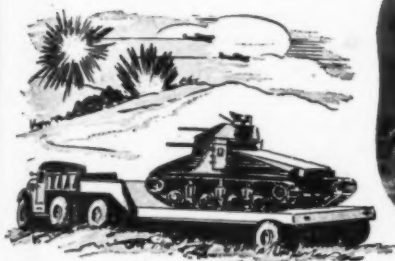
Recently devised emergency shear plates, quickly replaceable, are a safety improvement against roll breakage on aggregate crushers made by the Iowa Manufacturing Co., Cedar Rapids, Ia. Under ideal working conditions, heavy helical springs of chrome vanadium steel maintain proper tension on the floating roll and keep the opening for material constant; yet when uncrushable foreign



Emergency shear plate

material is introduced the springs protect the roll by relieving the undue stress and prevent breakage. If exceptionally large uncrushable material passes into the rolls shear plates at the butt of the springs snap and free the springs completely. Each shear plate consists of 11-gauge sheet iron, and is located in the lot of the adjustable plate that holds the spring in position as shown in the drawing. Any large piece of uncrushable material, such as tramp iron, would cause the nut, slotted for and holding the shear plate, on the end of the adjustable screw bolt, to shear the plate and allow the unrestrained bolt to pass through the spring and instantly release all tension on the floating roll. To resume operation it is only necessary to replace the shear plates. Extra plates are furnished with each crusher.

YOUR PEACETIME JAHN TRAILER WILL BE BETTER BECAUSE OF BATTLEFRONT PROVING GROUNDS



Any Axle or
Wheel Combination



"Come to Trailer Headquarters"

DAY AFTER DAY, hundreds of Jahn trailers are speeding the movement of tractors, bulldozers, power shovels, tanks, and many other heavy pieces of war equipment on battlefronts all over the world. They are building up a store of experience that will mean even more payload per pound of peacetime trailer.

Deep, wide flange beams, multiple oscillating type rear axles which provide equal distribution of load over all tires, heavy bearings, springs and wheels enable Jahn trailers to stand up under heavy road shocks and carry occasional overloads. For your peacetime heavy duty trailers come to trailer headquarters now.

C. R. JAHN COMPANY

1345 WEST 37th PLACE

CHICAGO, ILLINOIS

HANSON EXCAVATORS

$\frac{3}{8}$ and $\frac{1}{2}$ cu. yd.

Crawler or Truck Mounted

Full Revolving - Chain Crowd - Welded
Steel Construction - Gasoline or Diesel

Convertible to
Shovel - Trench-Hoe - Dragline
Clamshell - Crane - Pile Driver

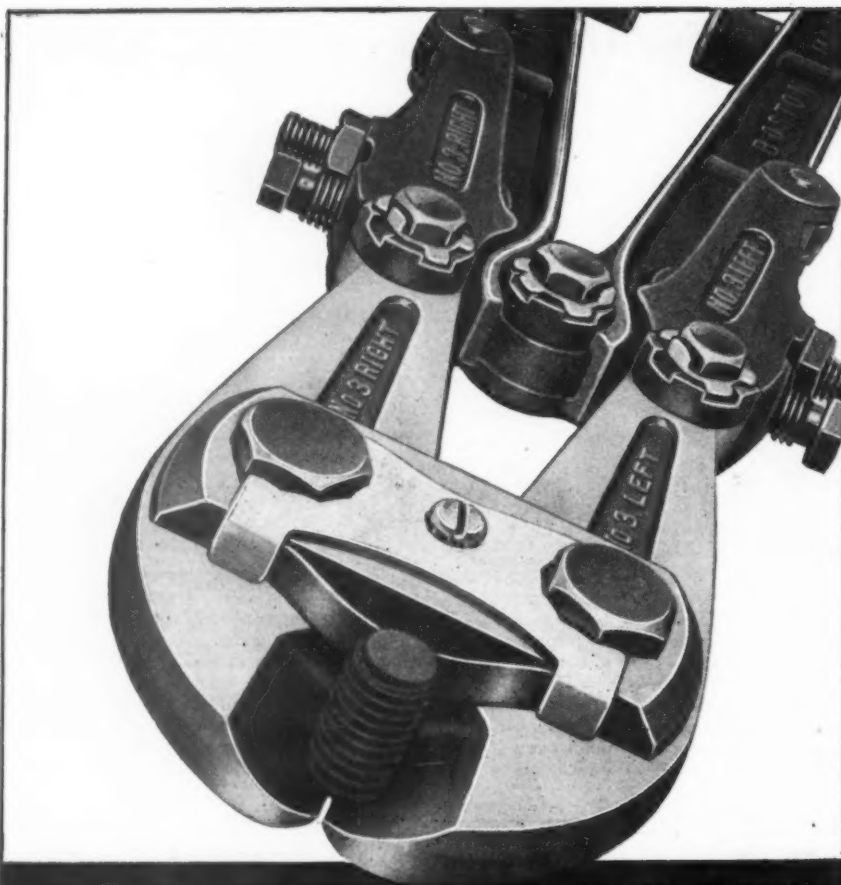


Our full production is now being used by our Fighting Forces in All Parts of the World. Present Hanson Equipment Owners on the Home Front are assured all orders for repairs will receive our immediate attention and shipped promptly.

THE HANSON CLUTCH & MACHINERY CO.

Phone 417

Tiffin, Ohio



PORTER TWO-HAND CUTTERS

NO OTHER POWER REQUIRED

Porter cutters save time and labor whether used on repairs, construction, production, or in emergencies.

Rod, bolt, flat bar, cable, wire, and chain cutting; flush, overhead, on floor, etc., are only a few of the operations easily and quickly performed by hand with Porter standard cutters. Porter special tools for heading, pressing, crimping, punching, and caulking are equally efficient.



Write for Porter Catalog, illustrating and describing the Porter line — also a free copy of Tool Maintenance Book — a practical manual on the use and care of clippers, saws, chisels, files, and other hand tools. A request on post card or letter-head will bring it without charge.

H. K. PORTER, INC., 426 Ashland St., Everett 49, Mass.

PORTER HKP CUTTERS

ROADS AND STREETS, July, 1944

CORONACH

*"Of these immortal dead who live again
In minds made better by their presence."*

DANIEL C. GREEN, chairman of the board and chief executive officer of the Cleveland Pneumatic Tool Co. and its wholly-owned subsidiary Cleveland Pneumatic Aerol, Inc., manufacturers of aircraft landing gear, died July 2. Mr. Green was known nationally as a financier and consultant in the operation of public utility properties and had been made board chairman of Cleveland Pneumatic at the request of the War Production Board shortly after the death of L. W. Greve. His service with Cleveland Pneumatic dates from March 25, 1942, when he accepted the position purely as a war assignment and with the understanding that he would return to the professional consulting field as soon as his work with the tool company was completed. Mr. Green was named company president in June 1943, when John DeMooy resigned, later gave up the presidency to George P. Torrence, and became the board chairman, which position he held at the time of his death.

HENRY L. HOWE, City Engineer and Deputy Commissioner of Public Works of Rochester, N. Y., died May 31, aged 56. He was graduated from Cornell University in 1910 and was employed by the Rochester Railway & Light Co. and then the Eastman Kodak Co., until 1912, when he entered the employ of the city of Rochester. He started as assistant engineer of sewage disposal and was employed by the city continuously, except during World War 1, when he was a Lieutenant, S. G., U. S. Navy. He was ordered to inactive duty in 1919 with the rank of Lieutenant Commander, U.S.N.R. He was a national figure in public works engineering. In 1943 he was president of the American Public Works Association.

COL. WARREN R. ROBERTS, former engineer of bridges for the city of Chicago, Ill., died June 30, at Miami, Fla., where he had lived in recent years. He was 80. During World War 1 Col. Roberts was in charge of Army construction in the Chicago area. He served as engineer of bridges for Chicago in 1893 and 1894 and was president of the Roberts & Schaefer Co., Chicago, from 1904-26.

SUPER-ABILITY of the Versatile DUCK

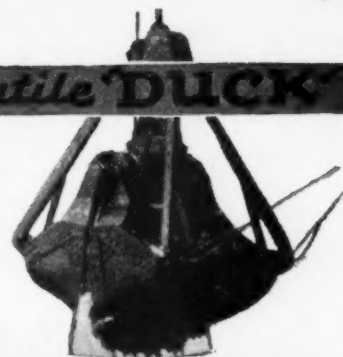


Like the amazing duck that performs on land or water Owen Dredging Buckets are designed to withstand the special difficulties of under water service or the most severe kind of digging on land. Protection of bearings against water and grit is a feature. Write for literature.

THE OWEN BUCKET CO.

BREAKWATER AVE., CLEVELAND, O.

BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

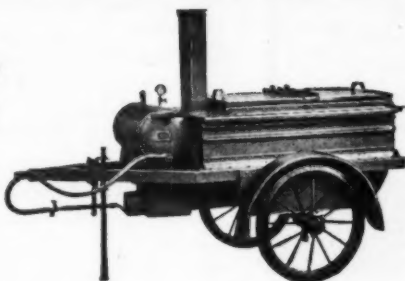


OWEN BUCKETS

A MOUTHFUL AT EVERY BITE

CONNERBY'S HEATING KETTLE

For speedy
heating of
tar and
asphalt—



Use this CONNERBY oil-burning Patrol Patching Heater on the *small* job and this CONNERBY oil-burning kettle for *large-quantity* production.



Write for catalog showing our full line of tar and asphalt heating kettles, spraying attachments, pouring pots, etc.

CONNERBY CONSTRUCTION CO.

3900 North Second St.

Philadelphia, Pa.

A TRENCH HOE ON WHEELS...

With a digging depth of eleven feet, the Michigan combines real trench hoe advantages with convertibility to Shovel, Clam, Crane, and Dragline. Made in two sizes — $\frac{3}{8}$ yard or $\frac{1}{2}$ yard capacity.

ASK FOR
NEW BULLETIN
T-4



MICHIGAN

POWER SHOVEL CO.

BENTON HARBOR, MICHIGAN

Time-Tested
Special Features



FOR ALL MAKES OF TRUCKS



For Efficiency and
Long Service at Low
Operating Costs.

Keep in touch with our Distributors—
write for the name of nearest one.

THE PERFECTION STEEL
BODY CO.
Galion, Ohio

PERFECTION

TRUCK BODIES AND HOISTS

ROADS AND STREETS, July, 1944

LACLEDE HIGHWAY STEELS



WIRE MESH
Slab reinforcement keeps cracks closed and holds slab together.

DOWEL SPACERS
Assures correct alignment and simple installation of shear dowels.

CENTER JOINT
For controlling longitudinal cracking of pavement.

Specify Them!!

REPORTED HIGHWAY RESEARCH INDICATES STEEL REINFORCEMENT IS NECESSARY IN PAVEMENTS FOR LONG LIFE AND LOW MAINTENANCE.

LACLEDE STEEL COMPANY
ST. LOUIS, MISSOURI

Shunk
Superior Quality
BLADES
AND CUTTING EDGES

For any make of machine
Motor Graders, Motor
Scrapers, Scrapers, Dozers,
Bulldozers, Backfillers,
Wagon Scrapers, Trail
Builders, Trail Bladders,
Carroll's, Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

30 years of manufacturing blades has developed for you a special steel, milled through our own rolls and forged at the edges to give that extra wearing quality you need.

All widths lengths, and thicknesses. S.A.E. S.A.D. ready to fit your machine.

Consult your international recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for blades early.

Shunk
MANUFACTURING COMPANY
Established 1854
BUCYRUS, OHIO.

Member of A.E.D.

ROADS AND STREETS, July, 1944

NATIONAL GUNITE
Pressure-Packed
CONCRETE
has superior advantages:



Low water ratio assures density at all points—no voids, no bubbles or air pockets . . . Waterproof—perfect steel protection.

... Greater strength with less thickness . . . No waste of material . . . Great savings in time.

Recommended for rebuilding or relining disintegrated concrete and steel as well as new work.

National Gunite is a coast-to-coast engineering organization with years of experience, supplemented by field crews of skilled Gunite operators.

Write, giving your requirements

NATIONAL GUNITE CORPORATION

420 Lexington Ave., New York 17, N. Y.
Boston Washington

A. H. KOEBIG, SR., partner of the engineering firm of Koebig & Koebig, Los Angeles, Calif., died recently, aged 92. Coming to Los Angeles in 1884, after four years as chief assistant engineer for the Santa Fe Ry., he entered private practice. In 1910 he took his son, A. H. Koebig, Jr., into partnership, under the firm name Koebig and Koebig.

WILLIAM L. SCHLOSS, founder and president of the Schloss Asphalt Paving & Products Co., Cleveland, O., died June 11, aged 61. His company paved many of the streets and roads in Cleveland and Cuyahoga County, Ohio.

WILLIAM F. SAYER, Superintendent of Streets of Jerseyville, Ill., died recently, aged 65. He was a retired contractor having been engaged in bridge construction for 15 years. He was at one time construction superintendent for the Missouri Bridge & Iron Co., of St. Louis.

Karl E. Kneiss, Manager of the Asphalt and Road Oil Sales Department of Tide Water Associated Oil Co., for 13 years a director of The Asphalt Institute, died June 13 at the age of 72. A native of Cincinnati, O., Mr. Kneiss joined Tide Water Associated Oil Co. in May, 1907, was active in various executive capacities in the sales department, and later became manager of the asphalt and road oil sales department. Mr. Kneiss was treasurer of The Asphalt Institute, Pacific Coast Division, for a number of years.

WILLIAM R. CRUSE, Assistant to the Deputy Commissioner—Chief Engineer, Michigan State Highway Department, died June 23 after an extended illness. He had been with the department since March 16, 1935. Before that he had been city engineer and acting city manager of Jackson, Mich.

JOHN B. HITTELL, for more than 30 years chief street engineer for the Board of Local Improvement of Chicago, Ill., died July 5, aged 72. Before his retirement three years ago he had supervised most of the city's paving improvements. He was a past president of the Illinois Society of Civil Engineers, a member of the American Society of Civil Engineers and a founder of the American Road Builders Association.

SAMUEL H. HEDGES, a retired contractor, died June 28 at Seattle, Wash. He was 78 years old. From 1905 to 1928 he was president of the Puget Sound Bridge & Dredging Co.

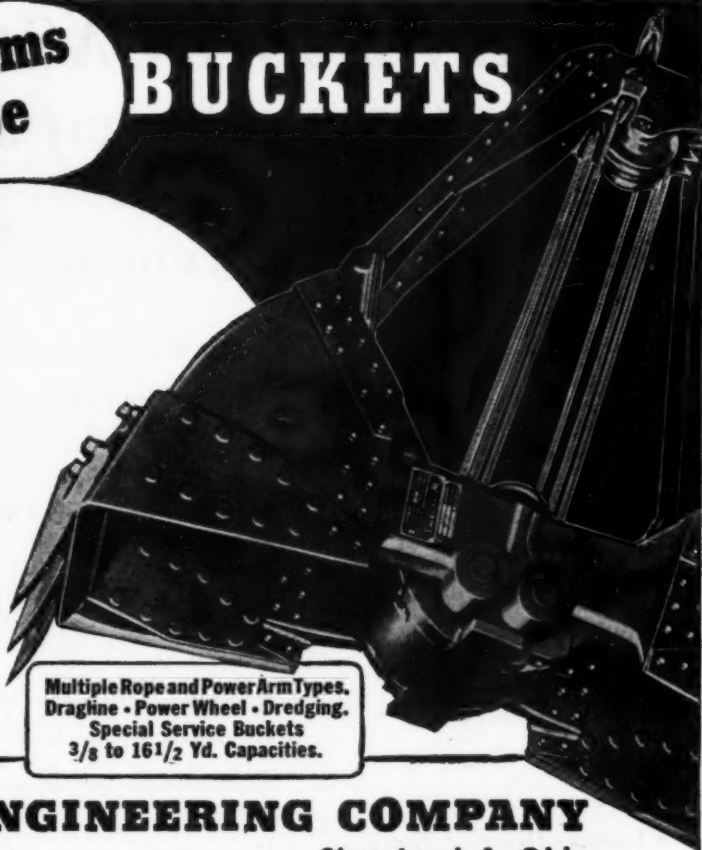
WELLMAN Williams Type BUCKETS

Welded Rolled Steel FOR GREATER STRENGTH AND LONGER SERVICE

Wellman Buckets combine all the mechanical advantages of the famous Williams Bucket with the welded construction features formerly found in Wellman custom-built heavy duty steel mill buckets.

Send for Free Bulletin

Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly prove why YOUR NEXT BUCKET SHOULD BE A WELLMAN-WILLIAMS.



Multiple Rope and Power Arm Types.
Dragline - Power Wheel - Dredging.
Special Service Buckets
3/8 to 16 1/2 Yd. Capacities.



THE WELLMAN ENGINEERING COMPANY
7003 Central Avenue
Cleveland 4, Ohio
SALES AND SERVICE AGENCIES IN PRINCIPAL CITIES

LOOK TO BYERS EXCAVATORS FOR PERFORMANCE

... day in day out,
on one, two or three shifts

Byers performance records on
airport, munition plants, strategic
roads, bridge and other projects
will suggest the pace you can hold
on your contract.



WHEN THE WAR IS WON

Byers will offer you new, improved, faster
mobile cranes and shovels for peacetime jobs.

BYERS

CRANES
AND
SHOVELS

RAVENNA, OHIO

DISTRIBUTORS THROUGHOUT THE WORLD

GRUENDLER CRAFTSMANSHIP Serving Industry over 50 Years

Peak Production! 150-200 TONS OF CRUSHED ROCK PER HOUR

Steam Shovel
sizes to 5" to 6"
minus in one-
operation

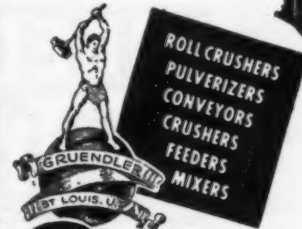
These heavy plate and cast
steel constructed roller bear-
ing JAW CRUSHERS have
tremendous crushing power.
Built to take it for continuous
operation with minimum main-
tenance. Built in all sizes,
stationary or portable.



Complete weight of 25x42
JAW CRUSHER is 54,200 lbs.

Mfgs. of Double Roll Crushers
and Hammer Crushers for Second-
ary Crushing requirements.

BULLETIN MAILED ON REQUEST



GRUENDLER

CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

ROADS AND STREETS, July, 1944

Twenty-two REASONS Why *FLEX-PLANE* Dummy Joints are Necessary in Modern Concrete Pavements

- Reduces the Number of Expansion Joints
- More Dummy Joints Divide Contraction Openings
- Prevents Cracking
- Retards Creeping
- Controls Warping
- Reduces Curling
- Relieves Stress
- Lessens Bumps
- Minimizes Pumping
- Minimizes Panning
- Lessens Deterioration
- Lowest Cost
- Limits Maintenance Cost
- Anchored in Place — Is Permanent
- No Extrusion
- Localizes Expansion and Contraction
- Assists in Normalizing the Slabs
- Ribbon Joint is Continuous in Length
- Prevents Infiltration of Water
- Increases Strength of Slabs
- Produces Homogenous Structure
- Provides Expansion Relief for the Hot Upper Part of the Slab



FLEX-PLANE joint installing machines eliminate messy hand methods. Install all types of joints . . . ribbon, poured, pre-moulded, etc., with or without VIBRATION.

• Ask for Equipment Specifications •

FLEXIBLE ROAD JOINT MACHINE CO. WARREN, OHIO U. S. A.

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.



TOOLS — THE WORLD OVER —
NOTED FOR QUALITY AND DURABILITY"

VULCAN TOOL MFG. CO.
QUINCY, MASS.

NEED A BIG Trailer?

*La Crosse Makes Them
Up To 200 Ton Capacity—
** WRITE OR WIRE ***

LA CROSSE TRAILER & EQUIPT. CO.
LA CROSSE, WISCONSIN U. S. A.

With the Manufacturers

New California Dealer for Madsen

Madsen Iron Works, Huntington Park, Calif., has appointed the General Equipment Co., San Leandro, Calif., as distributor in Northern California for the complete line of Madsen road construction equipment.

This line includes portable asphalt paving plants, oil-mix plants, gravel-mix machines, cement finishers, batching plants, rubber-tired rollers, and other construction equipment.

LaPlant-Choate Appoints General Works Manager

C. H. Lage has been appointed general works manager of LaPlant-Choate Manufacturing Co., Inc., of Cedar Rapids, Ia.

He will have charge of all plant operation and production carried on by the company. Mr. Lage comes to LaPlant-Choate from Universal Unit Power Shovel Corp., of Milwaukee, Wis., where he was vice-president in charge of manufacture since 1941. Concurrently, he was also works manager of the Davis Thompson Co., which is controlled by the same financial interests as Universal Unit Power Shovel Corp. For 12 years prior to 1941, Mr. Lage served with Caterpillar Tractor Co., Peoria, Ill., as factory division superintendent in charge of the parts machine shop, the manufacture of special attachments and the assembly of attachments and equipment sent to "Caterpillar" for mounting by allied manufacturers. During the last nine years with "Caterpillar," he was in charge of planning.



C. H. Lage

E. R. Galvin Becomes President Tyson Roller Bearing Corp.

Ed R. Galvin has resigned as sales manager of R. G. LaTourneau, Inc., Peoria, Ill., to accept the presidency and a directorship with the Tyson Roller Bearing Corp., Massillon, O. He assumed his new duties on July 1. Mr. Galvin came to Peoria from Ohio in 1927 to join the Caterpillar Tractor

Co. as a district representative. He shortly was promoted to Eastern sales manager and then to general sales manager. He resigned as general sales manager at "Caterepillar" to accept a similar position at R. G. LeTourneau, Inc., in November, 1938.

G. S. McKenty New General Sales Manager for LeTourneau

Gordon S. McKenty has been named general sales manager for R. G. LeTourneau, Inc., Peoria, Ill., to succeed Ed R. Galvin, resigned to accept presidency and a directorship of the Tyson Bearing Corporation at Massillon, O. Mr. McKenty was graduated from the University of Nebraska in 1924



and subsequently served as an engineer in Mexico and China for International Telephone and Telegraph, a task including rebuilding of the entire Shanghai telephone exchange. He was in Nebraska construction equipment sales field for five years prior to joining LeTourneau in 1935. With LeTourneau, Mr. McKenty began as a district sales representative in a score of middle western and eastern states. From 1941 to 1943 he managed and expedited \$8,000,000 in War Department shell contracts fulfilled by LeTourneau plants at Toccoa, Ga., and Vicksburg, Miss. In 1943 he started successful reorganization of LeTourneau's parts shipping, grown from a \$25,000 monthly pre-war business to currently more than \$1,000,000 monthly. Completion of the R. G. LeTourneau, exclusive distributorship policy, already 70 per cent fulfilled, is among Mr. McKenty's first assignment as general sales manager.

American Rolling Mill Co. Buys Ohio Corrugated Culvert Co.

The American Rolling Mill Co. has purchased the assets of the Ohio Corrugated Culvert Co., of Middletown, O., and the Shelt Co., of Elmira, N. Y. Both companies will be operated by a wholly-owned Armco subsidiary, Armco Drainage and Metal Products, Inc. The Ohio Corrugated Culvert Co., a pioneer manufacturer of metal culverts, was organized early in the 1900's. As sheet metal demonstrated its usefulness in this field, production of other drainage and allied products was initiated. It op-



SISALKRAFT

The Concrete Curing Blanket That Protects War Goods Enroute to Fighting Fronts!

This picture shows SISALKRAFT in use about four years ago on a concrete job, preventing quick evaporation and protecting the newly poured concrete.

Today, SISALKRAFT is protecting deck loads of equipment, arms, ammunition and other war supplies. In the holds of our merchant marine SISALKRAFT is protecting shipments of medicines, foods and clothing from high humidity, rot and rough handling.

The very same qualities that made SISALKRAFT the Number One concrete-curing agent are the reasons why it now protects supplies enroute to our boys "over there."

Over 24 years of proven dependability, on thousands of concrete jobs, won for SISALKRAFT the distinction of being in the specifications of 40 State Highway Departments. Contractors have used it over and over again — finally using their "old" SISALKRAFT blankets to protect subgrades and materials.

The war record of SISALKRAFT shows that this scuff-proof, weather-resistant, tough material can take amazing punishment! When Victory is won SISALKRAFT will again be available. Put it *first* on your list for postwar work!



Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

ERIE PORTABLE AggreMeters

36-YARD
52-YARD
68-YARD


Plan now for post-war.
Get the complete
story on these 3 Erie
standard portable
storage and weighing
AggreMeters

ERIE STEEL CONSTRUCTION CO • ERIE, PA.
AggreMeters • Buckets • Concrete Plants • Traveling Cranes

erates in Ohio and West Virginia. The Shelt Co. of Elmira was organized in 1930 to manufacture and distribute drainage products in New York, Pennsylvania, and New Jersey.

Joins H. O. Penn Staff

Stanley Wardell has been appointed advertising manager of the H. O. Penn Machinery Co., New York, and sales representative for New Jersey. For the past 19 years, Mr. Wardell has operated the S. E. Wardell Co., an advertising service business, specializing in direct-by-mail advertising, and the creation and printing of machinery catalogues. The advertising offices, which were at 154 Nassau St., New York, have been closed, and Mr. Wardell will devote his full time to sales and advertising for the rapidly expanding interests of H. O. Penn Machinery Co., Inc.



Stanley Wardell

Marion Directors Elect Board Chairman and President

The Board of Directors of The Marion Steam Shovel Co., Marion, O., at a special meeting June 23, elected a new chairman of the board and a president and general manager to fill the vacancy left by D. J. Shelton, deceased. J. M. Strelitz, prominent attorney of Marion, affiliated with banking and manufacturing interests, was made chairman of the board. He has been a director of The Marion Steam Shovel Co. since 1931 and its general counsel for the past 20 years. In the latter capacity he has been in close contact with Marion's many customers and is acquainted with their problems. C. F. LaMarche, success-

ful manufacturer of Marion and production authority, was appointed president and general manager. Mr. LaMarche has served The Marion Steam Shovel Co. as a director since 1939 and is thoroughly familiar with the shovel industry. Both of these men know the company's background and history and are fully aware of the tremendous postwar possibilities of its products.

Two New Vice-Presidents for Caterpillar

William Blackie and William J. McBrian have been made vice-presidents of Caterpillar Tractor Co., Peoria, Ill. William H. Franklin has been made Controller, succeeding Mr. Blackie in that position. Announcement has also been made of the appointment of Edward W. Jackson to the position of General Parts Manager of Caterpillar Tractor Co. His advancement to this position fills a vacancy created several months ago when L. G. Morgan resigned from that post to move to California and



William J. McBrian

William Blackie

become head of parts department activities on the Pacific Coast. Mr. McBrian, who has been treasurer of the company from November, 1938, to the time of his present advancement to vice-president and treasurer, joined the "Caterpillar" organization in 1928 as credit manager. He is a native of Illinois and a graduate of Indiana University. Mr. Blackie came to the "Caterpillar" organiza-

tion in May, 1939, as Controller. He is a native of Glasgow, Scotland, where he attended grade and high schools and served a five year apprenticeship for the degree of chartered accountant. Mr. Franklin's advancement to the position of Assistant Controller. Mr. Franklin is a graduate of Princeton University and a Certified Public Accountant and was engaged in public accounting work up to the time of entering "Caterpillar" employ in 1941. Mr. Jackson is a native of Baltimore, Md., and a graduate in engineering of Johns Hopkins University. He joined the Caterpillar organization in 1929.

Osgood and General Excavator Announce New Distributorships

Seven new distributors have been named by The Osgood Co. and The General Excavator Co., associate excavating and materials handling equipment manufacturers of Marion, O., according to a joint announcement by Sales Managers George S. Day, of Osgood, and Don B. Smith, of General. They are: Acme Equipment Co., Detroit, Mich., which will serve the Detroit area and 8 southern Michigan counties. Arthur C. Leake, Middletown, Va., who has been appointed for western Virginia and 2 counties in West Virginia. Municipal Sales Co., Richmond, Va., holding the distributorship for eastern Virginia and the Virginia Department of Highways. Walling Tractor and Equipment Corp., Portland, Ore., six counties in southern Washington and the entire state of Oregon. H. L. Baxter, Toronto, Ont., who has received the Canadian franchise for the Toronto area and additional territory in southern Ontario. Rousseau Equipment Co., Winnipeg, Man., will serve the province of Manitoba. Dominion Distributors, Ltd., St. John's, Newfoundland; entire crown colony. These new appointments, now in effect, are a part of Osgood-General's preparation program for the anticipated expansion in construction, excavating and materials handling fields after the war. Both companies now are fully engaged in production for our invasion forces, with power shovel and rubber-tired crane units in service on the home front and in every war theater. On the postwar "front," among the advanced machines will be the new General "Type 10," a rubber-tired, one-man, one-engine, crane-shovel combination which is said to cover, with revolutionary efficiency, an extremely wide range of jobs.

Books and Pamphlets Received

"PILE DRIVING HANDBOOK," by Robert I. Chellis, Pittman Publishing Corp., New York and Chicago. 276 p. \$4.50. One of the first handbooks on the subject to appear in a long time, this is an excellent reference of widest interest to engineers and contractors. Built on case material, it covers both pile foundation theory and successful driving methods and equipment and their adaptations to various conditions encountered. Contractors especially will find use for the tables of data on sizes and weights of hammers, extractors, essential details on bearing and sheet piles of various available types, etc.

In addition to experience developed by his own firm, Stone & Webster Engineering Corp., Mr. Chellis has drawn upon the knowledge of a wide list of engineering and contracting men.

"FOURTH SHORT COURSE ON HIGHWAY DEVELOPMENT," issued by Ohio State University, Columbus, publishes the papers given at this short course March 10 and 11, 1944. A valuable reference to the serious highway design student or engineer, its papers deal largely with highway landscaping and broad sound aspects of highway design and use.

New Trade Literature

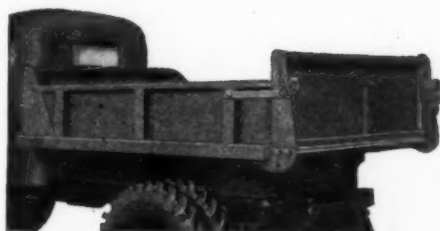
TRAVEL-MIX MACHINE—Madsen Iron Works, Huntington Park, Calif., has recently published Bulletin MP-120-6R on the Madsen road pug. It gives complete facts on the mechanical parts and construction of this travel-mix machine, tells how it operates, and what it will do.

ASPHALT PAVING PLANTS—A 20-page catalog showing mechanical features of its portable asphalt paving plant has been issued by the Madsen Iron Works, Huntington Park, Calif. The catalog is profusely illustrated with photographs, drawings, and diagrams; presents the new wartime developments in Madsen asphalt plants that have increased their daily production and have simplified their transporting and erection. Gives facts on the construction and operation of Madsen plants, how they operate, what they will do, where and how they performed on recent construction projects.

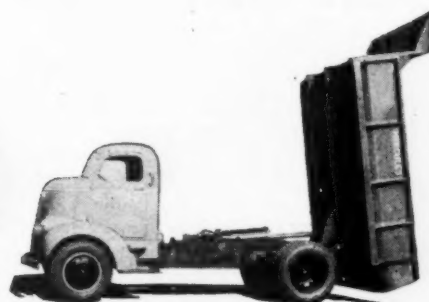
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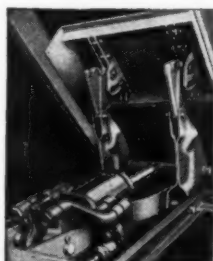
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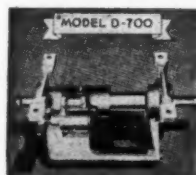
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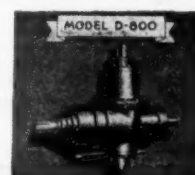
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- 1 Fuller Rotary Electric Driven Compressor, 360 C.F.M. @ 45#, Type C-70.
- 1 American Holst & Derrick Steel Stiffleg Derrick, 85' Boom, 15 Ton Capacity with Steam Hoist.

- 1 Ten Ton Traveling Steel Erection Derrick, 100' Boom with 18' Extension, 35' Mast, 35' Sills, complete with either Steam or Electric Driven Hoist.
- 2 Rex No. 200 Double Pumpcrete Units, Electric Driven, with Remixers and 2,000 Lbs. 8" Line and Accessories.
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- 1 Ingersoll-Rand Compressor, Type XRB, 870 C.F.M. @ 105#, with 150 H.P. Electric Motor and Motor Controls.
- 1 Ingersoll-Rand Compressor, Type XB, 1,300 C.F.M. @ 100#, with inner cooler and 200 H.P. Electric Motor and Motor Controls.

- 1 Ingersoll-Rand Compressor, Type 10, 1,400 C.F.M. @ 35#, with 150 H.P. Electric Motor and Motor Controls.

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- 2 K-428 Budas, 90 h.p.

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- 1 used R-33 Red Seal Continental, new crank shaft, bearings, rings.

- 1 used PE-383 Continental, 80 h.p., L.M.
- 1 PE-383, used, 80 h.p., new crank shaft, bearings, and rings, F.

- 1 PE-383 used Red Seal Continental, H.M.
- 4 PE-383 used Red Seal Continentals.
- 1 PE-383 used Red Seal Continental, No. 203.

- 1 Waukesha, 6-110, new shaft, bearings, and rings.
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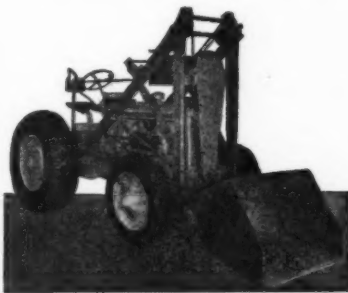


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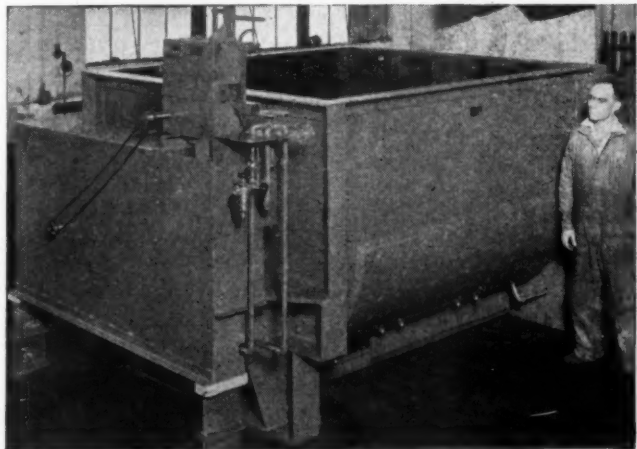
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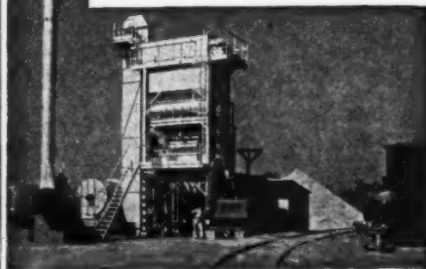
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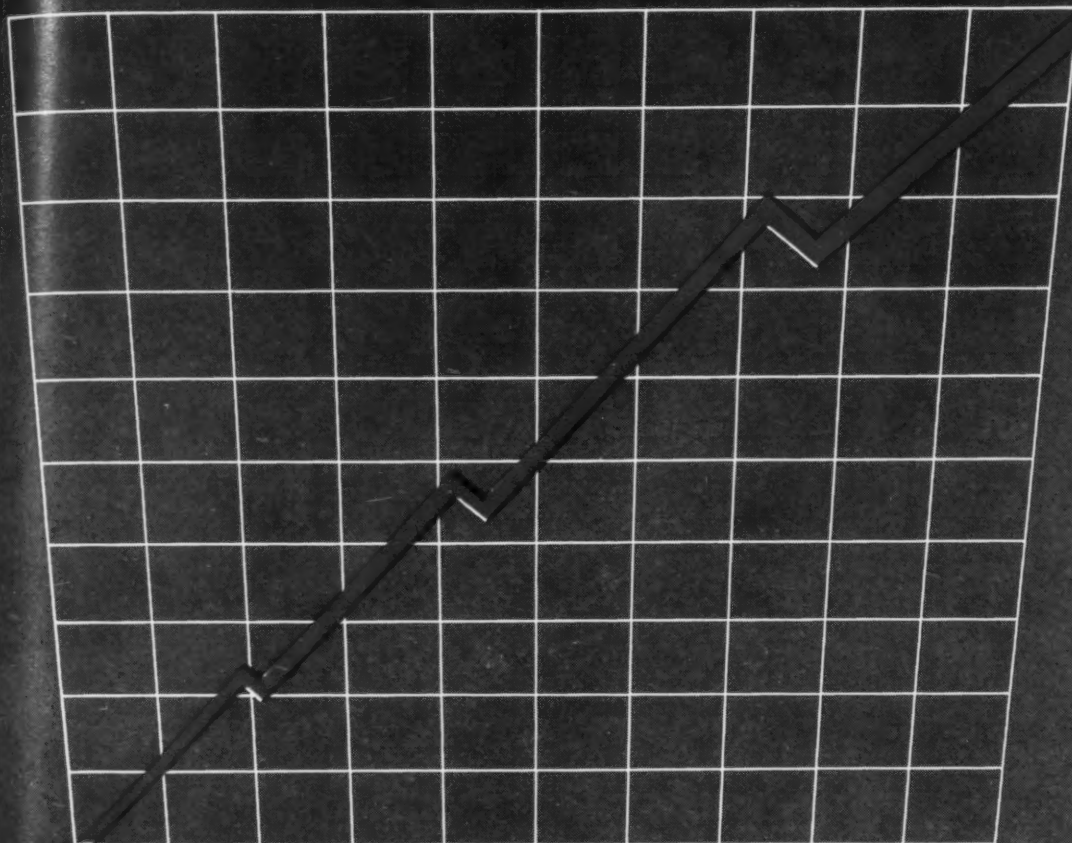
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